Jharkhand University of Technology, Ranchi

Diploma 3rd Semester Examination, 2024 (NEP)

Subject : Modern Surveying **Subject Code : CIV 302**

Time Allowed : 3 Hours **Full Marks : 70**

Pass Marks : 21

Answer in your own words.

Answer any five *questions in which* Question No. 1 *is compulsory.*
The figures in the margin indicate full marks.
All questions carry equal marks.

1. Choose the correct answer: 2×7=14

(i) Contour lines close together indicate _____ slope.

(a) steep (b) gentle

(c) uniform (d) undulated

(ii) Which of the following cannot be done with the help of theodolite in surveying?

(a) Laying off horizontal angles (b) Locating points on lines

(c) Prolonging survey lines (d) Measuring horizontal distances

(iii) Which of the following is used to test the horizontality of the transit axis or trunnion axis?

(a) Levelling head (b) Levelling screw

(c) Altitude bubble (d) Striding level

(iv) Which of the following is not a case in trigonometric levelling?

(a) Base of object is accessible.

(b) Base of object is inaccessible.

(c) Base of object is at accurate position.

(d) Base of object is inaccessible, station is not in vertical plane.

(v) Distance and elevation formulae for fixed hair method assuming the line of sight as horizontal and considering an external focusing type telescope is D = Ks + C, where C is _____.

(a) f/i (b) i/f

(c) f + d (d) f – c

(vi) Which of the following indicates the correct set of the combination of total station?

(a) Theodolite, compass (b) Theodolite, EDM

(c) Electronic theodolite, EDM (d) EDM, GPS

(vii) Which of the following is not a principle of remote sensing?

(a) Interaction of energy with satellite (b) Electromagnetic energy

(c) Electromagnetic spectrum (d) Interaction of energy with atmosphere

2. (a) Describe with the help of sketches the characteristics of contours.

(b) Explain the procedure to measure the reservoir capacity using contour plan. 7+7

3. (a) What are 'face left' and 'face right' observations? Why is it necessary to take both face observations? Why both verniers are read?

(b) Discuss various methods of theodolite traversing. 7+7

4. (a) Explain the procedure to measure horizontal angle by reiteration method.

(b) Describe data gathering and data processing in a total station. 7+7

5. The top (Q) of a chimney was sighted from two stations P and R at very different levels, the stations P and R being in line with the top of the chimney. The angle of elevation from P to the top of the chimney was 38° 21′ and that from R to the top of the chimney was 21° 18′. The angle of the elevation from R to a vane 2 m above the foot of the staff held at P was 15° 11′. The heights of instrument at P and R were 1·87 m and 1.64 m respectively. The horizontal distance between P and R was 127 m and the reduced level of R was 112·78 m. Find the R. L. of the top of the chimney and the horizontal distance from P to the chimney. 14

6. (a) What are the different methods employed in tacheometric survey? Describe the method most commonly used.

(b) What is total station? Explain its working principle, advantages, disadvantages. 7+7

7. Write short notes on *any four*: 3·5×4=14

(a) Four components of a transit theodolite

(b) Trigonometric Levelling

(c) Aerial Surveying

(d) Different systems of tacheometric measurement

(e) Drone Surveying

Jharkhand University of Technology, Ranchi

Diploma 3rd Semester Examination, 2024 (NEP)

Subject : Construction Techniques **Subject Code : CIV 303**

Time Allowed : 3 Hours **Full Marks : 70**

Pass Marks : 21

Answer in your own words.

Answer any five *questions in which* Question No.1 *is compulsory.*

The figures in the margin indicate full marks.

All questions carry equal mark.

1. Choose the correct alternative: 2×7=14

(i) Which of the following foundations is commonly used for buildings with multiple columns where the columns are close to each other?

(a) Isolated footing (b) Spread footing

(c) Combined footing (d) Raft foundation

(ii) The Standard Penetration Test (SPT) is conducted using which type of equipment?

(a) Dynamic cone penetrometer (b) Split-spoon sampler and drop hammer

(c) Plate load test apparatus (d) Shear vane apparatus

(iii) Which of the following is the main function of a beam in a structure?

(a) To transfer vertical loads to the foundation

(b) To support the weight of the roof only

(c) To resist bending and transfer loads to columns

(d) None of the above

(iv) Which type of bond is strongest in brick masonry?

(a) English bond (b) Header bond

(c) Flemish bond (d) Stack bond

(v) A stair turning through two right angles is known as a _____ stair.

(a) straight (b) geometrical

(c) spiral (d) dog-legged

(vi) Which type of lintel is recommended for large spans with heavy loads?

(a) Timber lintel (b) RCC lintel

(c) Brick lintel (d) All of these

(vii) Which paint is best for wooden surfaces?

(a) Water-based paint (b) Emulsion paint

(c) Oil-based enamel paint (d) Cement paint

2. (a) What are the main advantages of using terrazzo flooring in public buildings?

(b) Explain different types of field tests used to determine soil bearing capacity. 7+7

3. (a) What are the characteristics of a flat roof, and what are its advantages and disadvantages?

(b) Discuss different types of stairs along with standard size and characteristics. 7+7

4. (a) What are the key factors to consider while selecting a grout material for a specific application?

(b) Explain the importance of providing damp proof course at the plinth level. How does cavity wall construction help in preventing dampness? 7+7

5. (a) Briefly discuss various key factors to be considered while selecting shuttering material for a construction project.

(b) Explain various waterproofing techniques with their advantages and disadvantages. 7+7

6. (a) What are the different types of paints used in construction? Why is it necessary to apply a primer before distempering?

(b) Explain various types of bonds used in the construction works of brick masonry. 7+7

7. Write short notes on the following (*any four*): 3.5×4=14

(a) Scaffolding

(b) Terrace Waterproofing

(c) Raft Foundation

(d) Advantages of Oxide Flooring

(e) Types of Partition Walls

(f) Gunite and Shotcrete

Jharkhand University of Technology, Ranchi

3rd Semester Diploma Engg. Examination 2024

Full Marks: 70
Pass Marks: 21
Time: 3 Hours

Branch: Civil Engineering
Subject: - Building Drawing using CAD
Subject Code: CIV304

Instruction:

1. **Answer in your own words.**
2. **Answer Any Five questions in which Questions No.1 is Compulsory.**
3. **The figures in the margin indicate full marks.**
4. **All questions carry equal mark**

1. Choose the correct answer: (2x7=14)

(i) The plan of a building is-
(a) A sectional plan
(b) Drawn at sill level
(c) Projection on horizontal plane
(d) All the above

(ii) Which is not included in building codes?
(a) Mechanical integrity
(b) Safety
(c) Providing employment
(d) Structural integrity

(iii) The computer-aided design (CAD) hardware doesn't include.
(a) Graphic display terminals
(b) Computer
(c) Computer programmes
(d) Keyboard

(iv) Which is not a type of building?
(a) Educational Building
(b) Mercantile Building
(c) Institutional Building
(d) Domestic building

(v) The commands Erase, Copy, Mirror, Trim, Extend, Break etc belongs to which tool bar?
(a) Layer tool bar
(b) Style tool bar
(c) Modify tool bar
(d) Draw tool bar

(vi) Partially ventilated single stack system is the modified form of _____
(a) Single stack system and two-pipe system
(b) Single stack system and one pipe system
(c) One pipe system and two-pipe system
(d) Two pipe system

(vii) In a building, to provide ultimate comfort to occupants _____ can be used.
(a) AC (b) HVAC (c) Ventilators (d) HAC

7+7

2. (a) Explain the terminology in building bye laws? Mention the objectives of building bye laws?
(b) Classify different types of roofs and stairs with standard values in detail?

3. (a) Give a detailed note on noise and acoustic comfort. How do you design a building for thermal comfort?

(b) Explain any five command in brief as given below.

(i) LINE (ii) CIRCLE (iii) TRIM (iv) EXTRUDE (v) GRID (vi) COPY

7+7

4. (a) Write short note on components of building automation system?

(b) A size of room is 4.0 m x 3.0m. Which type of stair is most usefull ? Draw its

(i) Plan (ii) Elevation

Showing all dimensions. Take height of room to first floor 3.45 m.

7+7

5. (a) What are the various factors to be considered in selecting a site for residential building?

(b) Draw a neat sketch of an odd and even course of English Bond for a one and half brick

7+7

6. (a) Explain the following terms: (a) Minimum plot sizes (b) Floor area ratio

(b) Explain the factors to be considered in planning of educational institutions and banks

7. Write short notes on the followings: (Any four) 3.5 x4=14

(a) Orientation of a building
(b) Structural safety
(c) Station Point
(d) Cone of vision
(e) Aspect

Jharkhand University of Technology, Ranchi

Diploma 3rd Semester Examination, 2024 (NEP)

Subject : Engineering Mechanics and Strength of Materials **Subject Code : CIV 301**

Time Allowed : 3 Hours **Full Marks : 70**

Pass Marks : 21

Answer in your own words.

Answer any five *questions for which* Question No. 1 *is compulsory.*

The figures in the margin indicate full marks.

All questions carry equal marks.

1. Choose the correct alternatives: 2×7=14

(i) What defines a concurrent force system?

(a) Forces that are parallel to each other (b) Forces acting along the same line

(c) Forces passing through a single point (d) Forces that create a rotational effect

(ii) Hooke's Law is valid only within

(a) the plastic region of the material (b) the elastic limit of the material

(c) the proportional limit of the material (d) the ultimate tensile strength

(iii) The toughness of a material is measured by

(a) Tensile strength test (b) Hardness test

(c) Impact test (d) Fatigue test

(iv) If two forces of 10 N and 20 N act on a body at an angle of 90°, what is the magnitude of the resultant force?

(a) 22.36 N (b) 10 N

(c) 30 N (d) 14.14 N

(v) Poisson's ratio is defined as the ratio of

(a) longitudinal stress and longitudinal strain

(b) longitudinal stress and lateral stress

(c) lateral stress and longitudinal stress

(d) lateral stress and lateral strain

(vi) For a solid circular section of diameter d, the polar moment of inertia is

(a) $\frac{\pi d^4}{16}$ (b) $\frac{\pi d^4}{64}$

(c) $\frac{\pi d^4}{32}$ (d) $\frac{\pi d^4}{8}$

(vii) The slenderness ratio is independent of

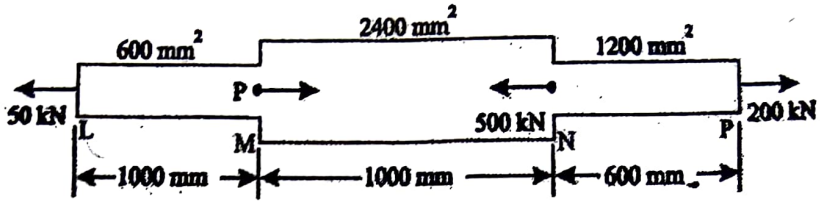
(a) length of the column (b) cross-sectional geometry

(c) radius of gyration (d) material properties

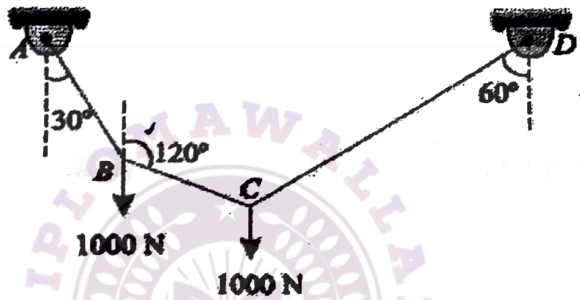
2. (a) A member LMNP is subjected to point loads as shown in figure. Calculate: 7

(i) Force P necessary for equilibrium.

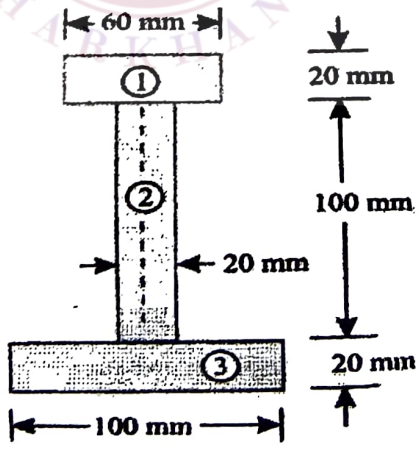
(ii) Total elongation of the bar
Take E = 210 GN/m^2



(b) A string ABCD, attached to fixed points A and D has two equal weights of 1000N attached to it at B and C. The weight rest with the portions AB and CD inclined at angles as shown in figure. Find the tensions in the portions AB, BC and CD of the string, if the inclination of the portion BC with the vertical is 120°. 7

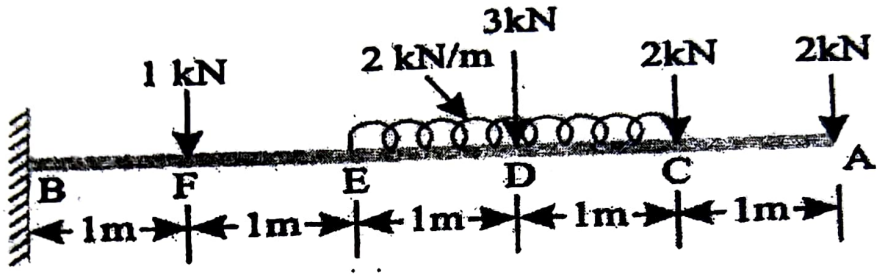


3. (a) An I- section is made up of three rectangles as shown in figure. Find the moment of inertia of the section about the horizontal axis passing through the centre of gravity of the section. 10



(b) Define the moment of inertia and its importance in engineering applications. 4

4. (a) A cantilever beam of 5 m long is loaded as shown in figure. Draw shear force and bending moment diagrams for the beam. 10



(b) Define a beam in structural engineering and describe the various types of beams. 4

5. (a) Derive the flexural formula and explain how it relates bending stress to the moment of inertia and the bending moment in a beam. 7

(b) What is the significance of the neutral axis, modulus of flexural rigidity and moment of resistance in beam analysis? 7

6. (a) What are the various methods for determining the deflection of a beam? 7

(b) What is the bending stress in a beam and what are the assumptions in the theory of pure bending? 7

7. Write short notes on *any four* of the following: 3.5×4=14

(a) Centre of gravity & centroid

(b) Principles of superposition

(c) Types of support used in beam structures

(d) Difference between short and long columns

(e) Principle of transmissibility of forces