Tertiary & Vocational Education Commission

Construction Technology

Model paper for NCT Equivalence Examination

Question No 01

i. Solve the equation and find the value of x ; (02 Marks)

$x^2 - 9x + 14 = 0$

ii. Briefly explain the key components that should be included in a bar schedule; (03 Marks)

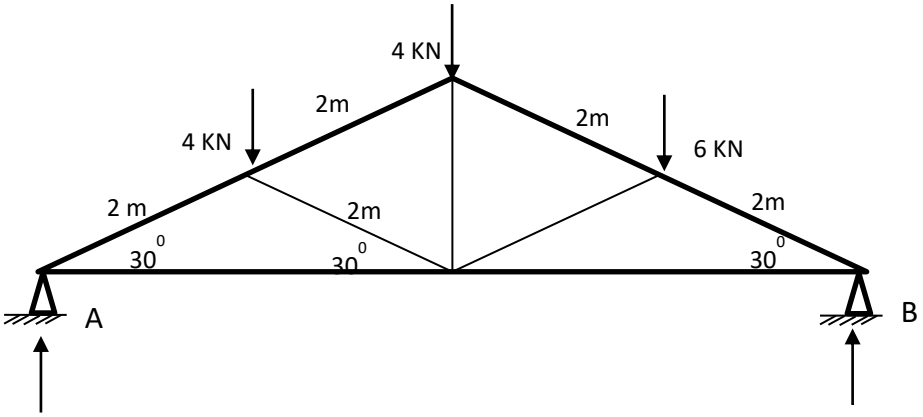
iii. Explain the difference between Perspective View and Isometric view and draw sketches; briefly describe the use and interrelationship of architectural drawings and structural drawings for a construction project. (11 Marks)

Question No 02

i. Explain "Ductility" and "Creep" in metals. . (04 Marks)

ii. Explain the effects of point loads and uniformly distributed loads on a simply supported beam. (04 Marks)

iii. Find the reaction at the points of A and B. (08 Marks)

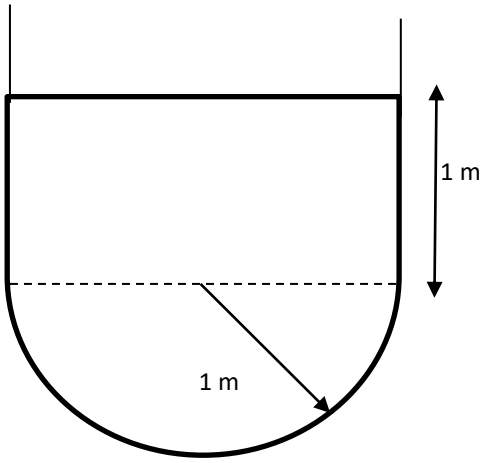


Question No 03

i. What do you mean by "Pressure gauge"? Explain. (04 Marks)

ii. What is the Manning's Formula? Denote its components. (03 Marks)

iii. The figure given below is a cross section of a channel with a semicircular bottom and two vertical sides. The bed gradient is 1:1000. Calculate the discharge through the channel if the Chezy's constant is 70. (09 Marks)



Question No 04

i. Explain the process of compaction and curing of concrete; what are the tools and equipment that you will use for those activities? (05 Marks)

ii. What are meant by "Metal Alloy, Ferrous metal & nonferrous metals"? Explain with examples of the use of them in construction. What are their advantages and disadvantages? (08 Marks)

iii. What are the measures you should take to store cement at the site while maintaining the properties? (03 Marks)

Question No 05

i. What are the important data/ information, tools and equipment you require for setting out a building? Explain the steps you follow when setting out a simple single storied building. (07 Marks)

ii. Explain with sketches "Back sight, fore sight and intermediate sight" in surveying and levelling. Explain the procedure of Chain Surveying at a site. (06 Marks)

iii. Discuss the common errors that can be observed in carrying out Surveying & Leveling. (03 Marks)

Question No 06

i. Explain the tools that are used for site communication with tiers of your superior level officers and the workmen under you. Give examples with justifications to your answer. (07 Marks)

ii. Describe the communication process. (03 Marks)

iii. Explain the process that you follow if a serious accident has happened at the site. (03 Marks)

iv. What are the preliminary works in site planning before mobilizing to the site? (03 Marks)

Question No 07

i. The following terms demonstrate some characteristics of soil parameters. Define them and explain; (08 Marks)
    a. Permeability and Porosity
    b. Bulk density and dry density
    c. Saturated soil and unsaturated soil

ii. Explain the significance and the purpose of soil testing in construction. What are the key factors expected from soil testing for foundation design and construction of large buildings? (05 Marks)

iii. Explain a test for Dry Density of a soil sample. (03 Marks)

Question No 08

i. The roles of the Consultant, Project Manager and the Site Engineer are equally important in successful completion of a project. Define their roles. Explain how they are interrelated an interdependent in working as a team? (08 Marks)

ii. What are the key resources primarily required considering for Construction Planning? Explain three (03) planning tools that are used in construction. (05 Marks)

iii. Discuss the usefulness of site meetings in planning site activities. (03 Marks)

Question No 09

i. What are the defects that can be observed in a newly plastered external wall, when the work does not maintain the quality as expected? Explain the root causes for such defects. (05 Marks)

ii. Describe the causes and the places for appearing the dampness in a building. In construction, what are the measures that should be taken to prevent the dampness? (05 Marks)

iii. Explain the types of loads that are enforced on the following elements; (06 Marks)
    a. Roof
    b. Floor Slabs
    c. Foundations

Question No 10

i. Differentiate the Tender documents and Contract documents with explanations on the documents that should be included in each of them. (06 Marks)

ii. Explain the information and data that are required to work out Office overheads and Site overheads, in tendering process. (04 Marks)

iii. Write short notes on the following: (06 Marks)

a) Lump sum contracts

b) Bill of Quantities

c) Preliminaries

Question No 11

i. What are the two (02) types of pavements in Highway constriction? Select one of them and draw a cross section of it. Also discuss the suitable materials for each of the layers of it giving reasons for selecting them. (09 Marks)

ii. Describe the importance of compaction of soils in roads construction. Give examples of three (03) types of equipment/ machineries used in compaction. What are the factors to decide on the type of machinery? (05 Marks)

iii. Name two (02) types of road maintenance. (02 Marks)

Question No 12

i. Name two (02) main types of waste water/ sewage disposal systems for a 5 storied building? Draw a sketch of one of them. (05 Marks)

ii. Draw and label a schematic diagram of a water supply system for a small housing community. (05 Marks)

iii. Write short notes on the following: (06 Marks)

a) BOD factor and COD factor

b) Centrifugal pump

c) Rainwater gulley

Question No 13

i. Explain the "Drip Irrigation" system with a neat diagram. What are the conditions that the Drip irrigation is most applicable? Briefly describe the advantages and disadvantages of Drip irrigation. (08 Marks)

ii. Surface irrigation is the most common system used in irrigation. What are the factors that affect the efficiency of water usage in surface irrigation? (05 Marks)

iii. Water from the main tank is distributed to the final farm outlets through a conveyance system. Name four (04) structures that are constructed in canal conveyance systems. (03 Marks)