Reg. No. ☐☐☐☐☐☐☐

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B.Arch. Degree IV Semester Supplementary Examination
April 2023

AR 1402 BUILDING MATERIALS AND CONSTRUCTION III
(2014 Scheme)

Time: 4 Hours

Maximum Marks: 100

(Use illustration wherever required. Illustrations carry due marks.)

PART A
(Answer *ALL* questions)

$(8 \times 5 = 40)$

I. Write short notes on the following:
(a) Structural Steel Sections.
(b) Alloys of steel.
(c) Space frames for roof construction.
(d) North light truss.
(e) Glazing bar.
(f) Properties and application of copper in building industry.
(g) Curtain wall.
(h) ACP.

$(2 \times 10 = 20)$

II. Explain in detail about the market forms of steel and its respective application with examples.

OR

III. Explain the various types of steel roof trusses with sketches.

IV. What do you understand by ferrous metals and non-ferrous metals? Explain the important properties of each.

OR

V. Explain with sketches the details of Aluminum false ceiling and the fasteners used.

PART B

$(2 \times 20 = 40)$

VI. Draw to suitable scale, the plan, section and elevation of a steel door for a masonry opening of size, 100 cm × 210 cm. Use standard steel sections. Mark the necessary parts and dimensions. Assume any other data required.

OR

VII. Draw to suitable scale, the plan, section and elevation of a steel spiral stair, diameter of 90 cm for a room of height 3.0 meters. Draw the handrail, tread and nosing details. Use standard steel sections, assume any other data required.

VIII. Draw to suitable scale, the plan, section and elevation of an aluminium sliding window to be fixed in a masonry opening of size 180 cm × 150 cm to get a maximum opening of 120 cm. Use standard aluminum sections. Assume any other dimensions required.

OR

IX. Draw to an appropriate scale, the plan, elevation, section of a glazed double leaf aluminum door of size 200 cm × 220 cm fixed on floor and aluminum transom, using standard aluminum profiles. Assume any other necessary data.

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AR 1403 HISTORY OF ARCHITECTURE III
(*2014 Scheme*)

Time: 3 Hours   Maximum Marks: 100

PART A
(Answer ALL questions)

(8 × 5 = 40)

I.   Write short notes on the following:
(a)   Triforium gallery.
(b)   Parts of Early Christian Church.
(c)   Explain with sketches about Tracery, Lancet and Flying Buttress.
(d)   Palladian Architecture.
(e)   Alhambra Complex, Granada.
(f)   Horseshoe Arches.
(g)   Forbidden City.
(h)   Shinto Architecture.

PART B

(4 × 15 = 60)

II.   Explain the planning principles and characteristics of Pisa Cathedral.
                                       OR
III.   Elaborate on Byzantine Architecture with Hagia Sophia as an example. Also explain about Romanesque Architecture with Pisa Cathedral as an example.

IV.   Explain in detail about Gothic Architecture and Renaissance Architecture with examples.
                                       OR
V.   Explain the Characteristic features of Baroque, Rococo and Palladian architecture style with examples.

VI.   Portray the planning principles and characteristics of Moorish Architecture.
                                       OR
VII.   Elaborate on Mayan architecture and its characteristics features.

VIII.   Write in detail with relevant sketches about
              (i)   Summer palace, Beijing
              (ii)   Temple of Angkor Wat, Cambodia.
                                       OR
IX.   Explain the architectural characteristic features used in Japanese architecture and Chinese architecture with examples.

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AR 1404 LANDSCAPE ARCHITECTURE
(2014 Scheme)

Time: 4 Hours   Maximum Marks: 100

(One drawing sheet to be supplied. All answers to be supported with relevant sketches)

PART A
(Answer **ALL** questions)

(8 × 5 = 40)

I.   Write short notes on the following:
   (a)   Evolution of landscape design.
   (b)   Characteristics of chinese gardens.
   (c)   Tangible landscape elements.
   (d)   Importance of water in landscape.
   (e)   Lighting in landscape design.
   (f)   Different types of outdoor lights used in landscape.
   (g)   Hydroponics.
   (h)   Plant selection criteria.

PART B

(4 × 10 = 40)

II.   Explain the characteristics of Mughal and English Garden .With the help of sketches describe important Mughal gardens in India.

OR

III.   Describe the three major forms of Roman gardens with examples.

IV.   Explain any five design elements in landscape with the help of sketches.

OR

V.   Explain the importance of plants and built element in landscape design.

VI.   Sketch the construction details of:
   (i)   Terrace pools
   (ii)   Retaining walls
   (iii)   Decks
   (iv)   Pergola.

OR

VII.   Explain landscape services and elaborate types, advantages and disadvantages.

VIII.   Explain the process of preparing and maintaining lawns, suggest how this effect can be created through indoor landscaping.

OR

IX.   Explain with examples the physical characteristics and habits of trees, shrubs, climbers and ground cover.

(P.T.O.)

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PART C
(Drawing)

$(1 \times 20 = 20)$

X.   Design an indoor courtyard for a residence of size 6 m × 8 m. Assume that the courtyard is covered on three sides and one among those is open to the living room. Courtyard has got a clear height of 5m. Assume North. Provide a plan and section in 1:20 scale. Explain design principles applied.

OR

XI.   Design a balcony garden for a residential building of size 8 m × 8 m. Assume that the garden is open on three sides with roof supported by a pillar at two corners opposite to the exterior terrace wall. The terrace has got a clear height of 8 m. Assume North. Provide a plan and section in 1:50 scale. Explain the design principles used.

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AR 1405 ARCHITECTURAL ACOUSTICS
(2014 Scheme)

Time: 3 Hours   Maximum Marks: 100

PART A
(Answer *ALL* questions)

$(8 \times 5 = 40)$

I.   Write short notes on :
- (a)   Sound Intensity
- (b)   Units of measuring sound
- (c)   Reverberation time
- (d)   Sabine's formula
- (e)   Sound absorption coefficient
- (f)   Transmission loss
- (g)   Structure borne sound transmission
- (h)   Cavity resonators

PART B

$(4 \times 15 = 60)$

II.   Explain in detail the properties of sound in relation to its nature and propagation.

OR

III.   Explain in detail noise and human behaviour.

IV.   Explain in detail the behaviour of sound in enclosed spaces in relation with room acoustics.

OR

V.   Explain in detail Acoustical defects in enclosed spaces with help of sketches.

VI.   Design an Acoustical wall in music room and explain how noise can be controlled.

OR

VII.   Explain in detail the design criteria for a lecture hall and how noise can be controlled with help of sketches.

VIII.   Differentiate between variable absorbers and membrane absorbers used for accoustical absorption. Give the mounting details of both absorbers.

OR

IX.   Explain Acoustical corrections of an Auditorium in detail with help of sketches.

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AR 1406 ESTIMATION AND SPECIFICATION
(2014 Scheme)

Time : 3 Hours   Maximum Marks : 100

PART A
(Answer *ALL* questions)

$(8 \times 5 = 40)$

I.   Write short notes on the following.

   (a)   BIS and PWD specification formats.

   (b)   Importance of specification in construction.

   (c)   The principles of writing specification in BIS, PWD, CPWD formats.

   (d)   General specification of earthwork excavation for foundation.

   (e)   Schedule of rates.

   (f)   Units of measurements.

   (g)   Method of estimating quantities.

   (h)   Standard specifications.
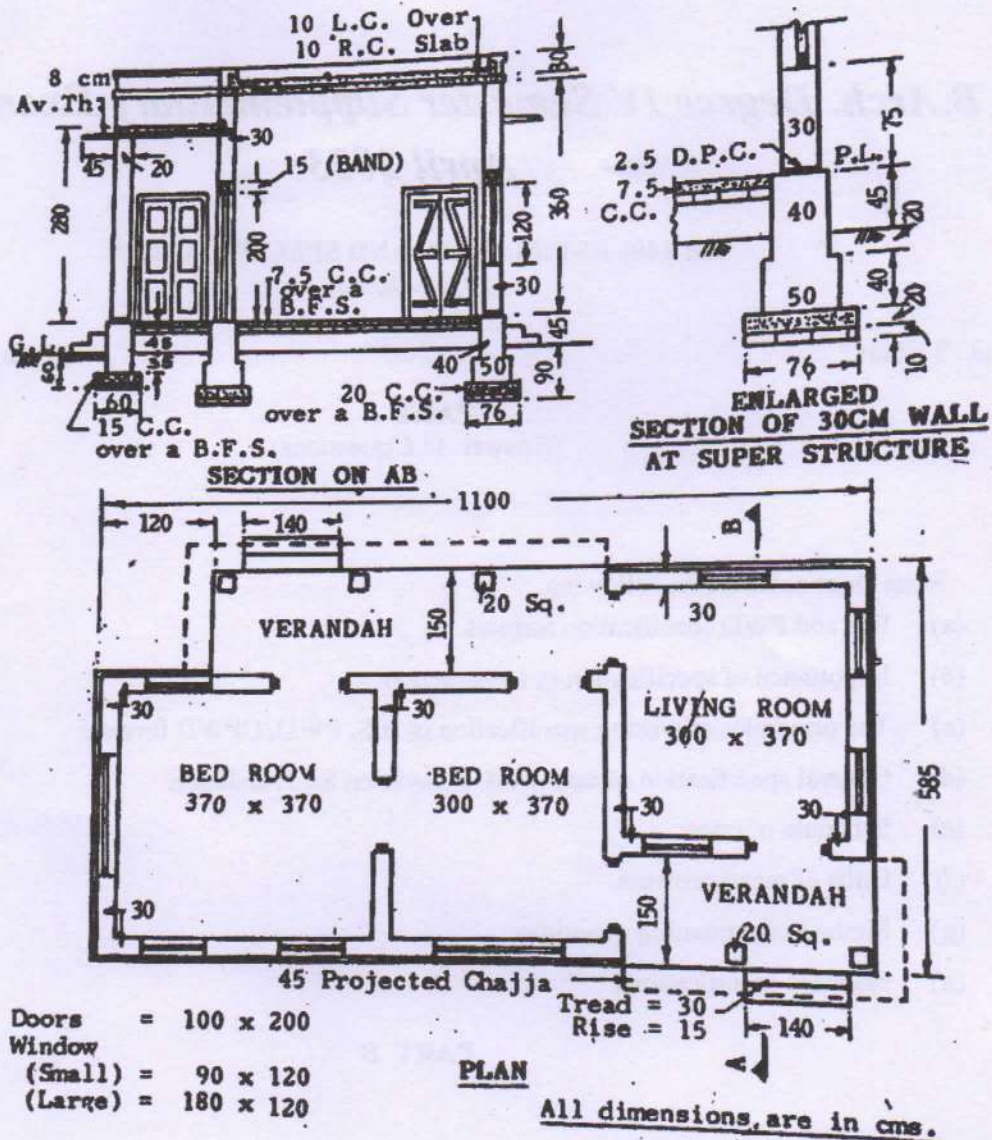
PART B

$(4 \times 15 = 60)$

II.   What is the importance of specification in a contract document?
                                        OR
III.   Write the detailed specification for (i) Cement (ii) Brick (iii) Coarse aggregate.

IV.   What do you understand by specification and how to write specification?
                                        OR
V.   Write the general specification of a second class Building.

VI.   Estimate the quantities of the following items from the drawing:

   (i)   Earthwork excavation for foundation
   (ii)   Cement concrete 1:3:6 in foundation
   (iii)   1st class brickwork with cement mortar 1:4 in foundation and plinth.

                                        OR
VII.   Estimate the quantities of the following items from the drawing:

   (i)   2.5 cm thick D.P.C with cement concrete 1:2:4
   (ii)   1st class brickwork in superstructure 1: 6
   (iii)   10 cm thick brickwork 1:4 in parapet walls.

(P.T.O.)

10 L.C. Over
10 R.C. Slab

8 cm
Av.Th.

15 (BAND)

7.5 C.C.
over a
B.F.S.

SECTION ON AB

**ENLARGED
SECTION OF 30CM WALL
AT SUPER STRUCTURE**

2.5 D.P.C.
7.5 C.C.

20 C.C.
over a B.F.S.

15 C.C.
over a B.F.S.

PLAN

VERANDAH

LIVING ROOM
360 × 370

BED ROOM
370 × 370

BED ROOM
300 × 370

VERANDAH

45 Projected Chajja

Tread = 30
Rise = 15

Doors = 100 × 200
Window
(Small) = 90 × 120
(Large) = 180 × 120

All dimensions are in cms.

VIII. Workout quantity of dry material and cost of material and labour for 1st class brickwork in superstructure in cement mortar 1:4 for 10 cu.m

The following rates at site may be considered:

Sand	– ₹450 per cu.m
Cement	– ₹350 per cu.m
Standard brick	– ₹20,000 on road (5000 Nos.)
Mixing mortar	– ₹50 per cu.m
1st class masson	– ₹550 per day
Man mazdoor	– ₹450 per day
Women mazdoor	– ₹350 per day.

OR

IX. Calculate unit rate for brick work for walls in cement mortar 1:4. Assume any appropriate data, if found necessary.

Bricks 19 cm × 19 cm × 9 cm	– 500 nos.
Cement	– 72 kg/m^3
Dry sand	– 0.20 m^3/m^3
Mason	– 0.70/m^3
Man	– 0.35/m^3
Women	– 0.70/m^3.

Approximate rates may be assumed.

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AR 1407 BUILDING SERVICES – I (WATER SUPPLY AND SANITATION)
(2014 Scheme)

Time: 3 Hours   Maximum Marks: 100

PART A
(Answer ALL questions)

(8 × 5 = 40)

I.   Write short notes on the following:
  (a)   What are the general requirements of domestic water storage tank?
  (b)   Define:
       (i)   Ferrule
       (ii)   Check valve
       (iii) Stop cocks.
  (c)   Write briefly the necessity of replacing the conservancy system by the water carriage system of sanitation.
  (d)   Enumerate the factors that affect the hydraulics of sewer lines.
  (e)   Define:
       (i)   Manholes
       (ii)   Catch pits
       (iii) Flushing tanks
       (iv)   Clean out
       (v)   Street inlet.
  (f)   List the objectives behind sewage treatment.
  (g)   Give a brief description on rain water harvesting with appropriate figure.
  (h)   Write a short note on sanitary appliances and list their types.

PART B

(4 × 15 = 60)

II.   (a)   Mention and discuss the factors that influence per capita demand.   (6)
      (b)   Give a reasonable estimate of average daily consumption of water for a   (9)
            residential town of 50000 populations. Suggest a possible breakup of
            consumption.

OR

III. (a)   General requirements of domestic water storage tank.   (6)
      (b)   Discuss the various appliances used for generating hot water.   (9)

IV.   Design a septic tank for the following data:-   (15)
      No. of people = 100
      Sewage/capita/day = 120 litres
      De-sludging period = 1 year
      Length : width = 4:1.

OR

V.   State the types of sewers used in sewerage systems, giving their sketches.   (15)
      Comment on their hydraulic properties.

(P.T.O.)

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VI.   Why sewers need to be properly ventilated? What are the methods used for   (15)
        ventilation of sewers?

                                            OR

VII.   Provide the construction details and design considerations of an Imhoff   (15)
        tank with neat sketches.

VIII.   Prepare a plan of a sewerage system of bathrooms, lavatory blocks and   (15)
        kitchen in a single storied residential building with design considerations.

                                            OR

IX.   Discuss in detail the mandatory requirements regarding water supply,   (15)
        sanitation and fire protection of buildings.

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AR 1408 STRUCTURAL ANALYSIS II
(2014 Scheme)

Time: 3 Hours   Maximum Marks: 100

PART A
(Answer **ALL** questions)

$(8 \times 5 = 40)$

I.   (a)   Explain the steps for consistent deformation method.

(b)   Differentiate between force method and displacement method.

(c)   Differentiate statically determinate and indeterminate structure.

(d)   Write a short note on displacement method of analysis.

(e)   Write short note on principle of superposition.

(f)   Write short notes on stiffness, distribution factor and carry over moment.

(g)   Explain moment distribution method. What are the steps involved in it?

(h)   Explain sway and non-sway analysis of frame.

PART B

$(4 \times 15 = 60)$

II.   Determine the reaction components of the beam shown in figure and draw SFD and BMD diagram.
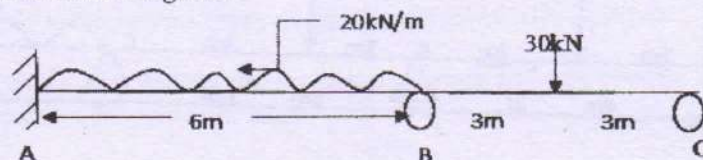
OR

III.   Find the fixed end moment and draw SFD and BMD for the beam given in figure.
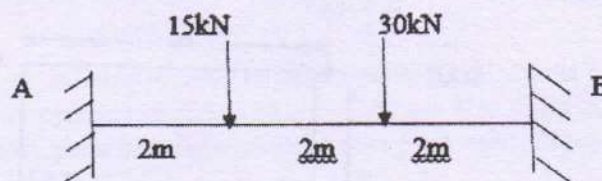
IV.   A continuous beam ABC fixed at A and C simply supported at B consist of span AB and BC of length 4 m and 6 m respectively. The span AB carries a UDL of 20 kN/m and BC carries a UDL of 12 kN/m. Find the support reactions and moments using three moment theorem. Also draw the bending moment and shear force diagram.
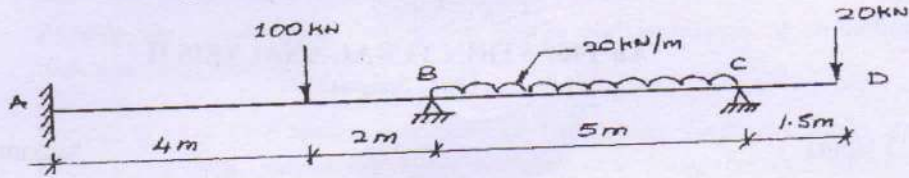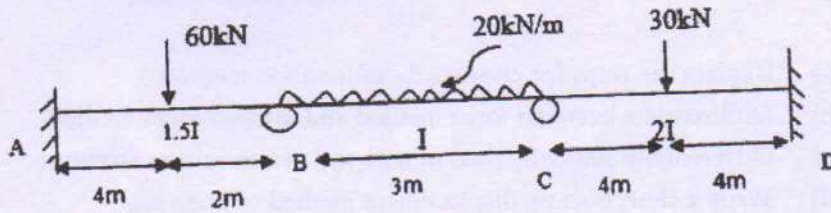
OR

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V. Analyse continuous beam ABCD by slope deflection method and then draw bending moment diagram. Take EI constant.


VI. Determine the support moment and draw the BMD for continuous beam shown in figure. Using moment distribution method.
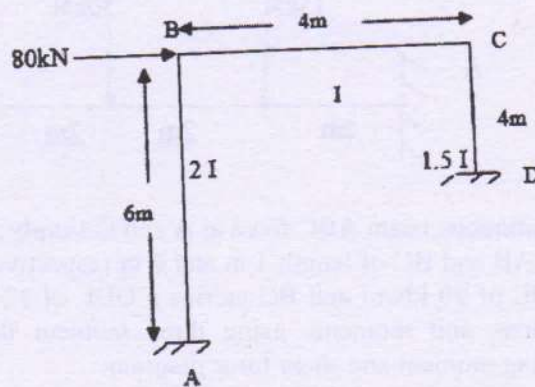

OR

VII. Analyse the given continuous beam ABC by moment distribution method. Support A is fixed and B and C are simply supported. Span AB is 7 m, moment of inertia is I, and it carries a point load of 30 kN at a distance of 5 m from A. Span BC is 5 m, its moment of inertia is 2 I and carries a Udl of 10 kN/m. Draw SFD and BMD.

VIII. Analyse the given beam using Kani's method.
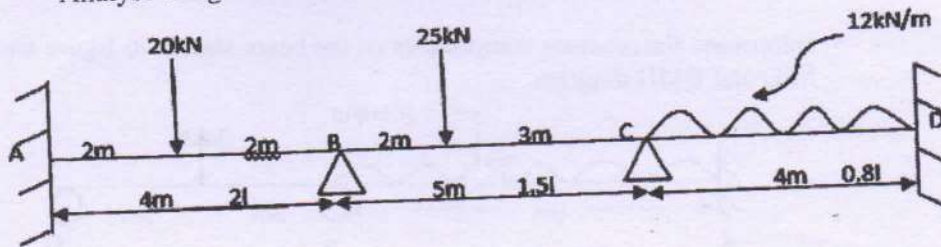
OR

IX. Analyse the portal frame shown in figure, using moment distribution method.

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