B

B.Arch. Degree IV Semester Regular/Supplementary Examination April 2022

AR 1402 BUILDING MATERIALS AND CONSTRUCTION III
(2014 Scheme)

Time: 4 Hours

Maximum Marks: 100

PART A

$(8 \times 5 = 40)$

I. Write short notes on the following:
  (a) Market forms of steel.
  (b) Heat treatment of steel.
  (c) General properties of ferrous metals.
  (d) Various options of roofing materials.
  (e) Use of aluminium extrusions in building.
  (f) Advantages of titanium and its properties.
  (g) Aluminium profiles for curtain walls.
  (h) Aluminium shop front handrails.

$(2 \times 10 = 20)$

II. What are the steel connections? Briefly explain the various purposes of steel connections provided in the steel structure as well as its various classification.

OR

III. Explain briefly the various types of steel and their general properties including their manufacturing process.

IV. Describe various standard profiles of aluminium for doors and windows. Indicate available sizes for various applications.

OR

V. What are the advantages and disadvantages of partition walling? Sketch the detail of fixing partition walls to RCC structural members.

PART B

$(2 \times 20 = 40)$

VI. Draw to the scale, the detailed plan, section and elevation of steel staircase fixed to exterior of an RCC multi-storeyed structure. Floor height is 360 cm and the width of staircase is 150 cm and riser is 15 cm and thread is 30 cm. Give the relevant joinery details along with balustrade details and give dimensions of ground floor. Assume other details, if required.

OR

VII. Give the details of steel doors and window combinations. The door dimension is 210×90 cm and window masonry opening 120×150 cm for a residence. Use the standards. Give detailing with full dimensions. Assume other details, if required.

VIII. Draw to a suitable scale plan, elevation and section of a sliding aluminium door for opening size 200 cm × 210 cm of an apartment. Brief specification and dimensions of parts have to be given in the drawing. Assume necessary details required for drawing.

OR

IX. Draw to a suitable scale plan, elevation and section of a hinged aluminium window for opening size 120 cm × 180 cm of an office space. Use standard profiles. Brief specification and dimensions of parts have to be given in the drawing. Assume necessary details required for drawing.

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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)   Techniques adopted in Byzantine dome construction.
- (b)   Characteristic features of Romanesque Architecture.
- (c)   Tracery and lancet.
- (d)   Gargoyles and baldachin.
- (e)   Muqarnas and Voussoirs in Moorish style.
- (f)   Urban design of Mayan Architecture.
- (g)   Pagodas.
- (h)   Temple of Cambodia.

PART B

(4 × 15 = 60)

II.   Explain the architectural characteristics of Early Christian Architecture quoting Old St.Peter's Rome as example.

OR

III.   Portray the planning principles and characteristics of Romanesque church architecture through Pisa Cathedral Complex. Explain with neat sketch.

IV.   Compare and contrast British (West Minister Abbey, England) and French gothic (Notre dame) styles of architecture through examples.

OR

V.   Explain in detail with neat sketches the works of Bernini during Baroque Architecture.

VI.   Explain the typologies influenced the development of Mayan Architecture.

OR

VII.   Explain the architectural characteristics of Moorish Architecture with Alhambra complex at Granada as example.

VIII.   Shinto shrines are more than any other architecture, the crystallization of the Japanese homage to tradition. Justify the statement.

OR

IX.   Summer Palace - The Royal Imperial Garden', Beijing. Briefly explain with neat sketches.

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April 2022

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) Scope of Landscape Architecture.
- (b) Characteristics of Mughal Garden in India.
- (c) Importance of scale and proportion in landscape design.
- (d) Role of texture in landscape.
- (e) Importance of analysing topography and hydrology.
- (f) Different types of outdoor lights used in landscape.
- (g) Plant Propagation techniques.
- (h) Factors considered in Indoor Landscaping.

PART B

(4 × 10 = 40)

II.   Explain the evolution of landscape from 16th century to the 21st century.

OR

III. Explain the concept of Mughal Garden. With the help of sketches describe important Mughal gardens in India.

IV.   Explain briefly the elements in landscape. Sketch a detailed garden explaining the elements in landscape designing.

OR

V.   How can we achieve unity in landscape design with the help of principles of landscape design?

VI.   Sketch the construction details of :
- (i)   Swimming pool
- (ii) Ramps
- (iii) Fountain
- (iv) Pergola.

OR

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

VIII. Explain in detail the elements to be considered while designing Indoor landscaping.

OR

IX.   Describe plant selection criteria to be considered while designing for Kerala climate.

(P.T.O.)

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PART C

<div align="right">(1 × 20 = 20)</div>

X.   Design an indoor courtyard for a residence of size 8 m × 8 m. Assume that the courtyard is covered on three sides and one among them is exterior jalli wall. Courtyard has got a clear height of 5 m with slap drop of 30 cm. Assume North. Provide a plan and section in 1:20 scale. Explain design principles applied.

OR

XI.   Design a terrace garden for a commercial building of size 10 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 with slap drop of 30 cm. Assume North. Provide a plan and section in 1: 50 scale. Explain your design.

<div align="center">***</div>

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April 2022

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 the following:
  (a)   Importance of acoustic in architecture.
  (b)   Decibel and threshold of audibility.
  (c)   Diffusion and it's role in designing.
  (d)   Sound transmission and transmission loss.
  (e)   Differentiate airborne and structure borne noise.
  (f)   Methods to control outdoor noise.
  (g)   Cavity walls.
  (h)   Acoustical materials we come across in our daily life.

PART B

$(4 \times 15 = 60)$

II.   Explain in detail the nature and propagation of sound.

OR

III.   Sketch and explain the human ear and hearing characteristics.

IV.   Explain the behaviour of sound within enclosed spaces and the factors that can modify this behaviour.

OR

V.   Explain the Sabine's formula for calculating the reverberation time. Tabulate major reverberation time required.

VI.   Design a wall on recording studio and explain the steps required to control noise.

OR

VII.   What are the acoustical requirement for auditorium and explain the design criteria?

VIII.   Explain the various sound absorbers used for acoustical treatment of a roof with sketches.

OR

IX.   Briefly explain the different types of sound diffusing and absorbing materials and their uses.

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AR 1406 ESTIMATION AND SPECIFICATION
(2014 Scheme)

Time: 3 Hours   Maximum Marks: 100

PART A
(Answer **ALL** questions)

(8 × 5 = 40)

I.   Write short notes of the following:
- (a) Principles of detailed specification writing.
- (b) Explain briefly about general specification.
- (c) Detailed specification of materials and laying for random rubble stone masonry.
- (d) Detailed specification of brickwork II and III class.
- (e) Explain long wall-short wall method.
- (f) SI units of measurements used in estimation.
- (g) Give a brief description of cube rate estimate for building.
- (h) Explain Schedule of Rates.

PART B

(4 × 15 = 60)

II.   Write general specification for first class and second class buildings.

OR

III.   Write general specification for cement, coarse aggregate and water.

IV.   Write detailed specification for cement concrete (1:2:4) in foundation.

OR

V.   Write detailed specification for damp proof course 2.5 cm.

VI.   Prepare an estimate of quantities for the items given below based on the attached drawing. Assume any appropriate data, if found necessary.
- (i) Earth work excavation.
- (ii) Brick work in cement mortar 1:6 for walls
- (iii) P.C.C 1:3:6 in foundation
- (iv) Plastering with cement mortar 1:4 for interior walls.

OR

VII.   Prepare an estimate of quantities for the items given below based on the attached drawing. Assume any appropriate data, if found necessary.
- (i) RR masonry for plinth
- (ii) RCC roof slab with 45 cm projection around the external walls
- (iii) Skirting for all rooms
- (iv) Floor Finish

(P.T.O.)

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VIII.   Calculate unit rate for brickwork in cement mortar 1:6. Assume any appropriate data, if found necessary.

Data:
Bricks 19 cm × 19 cm × 9 cm	=	500 Nos.
Cement	=	450 kg/ m^3
Sand	=	0.24 m^3/ m^3
Mason	=	0.73/ m^3
Man	=	0.35/ m^3
Woman	=	0.70/ m^3

Rates
Brick	=	INR 7000/1000 Nos.
Sand	=	INR 1200/m^3
Mason	=	INR 800/person
Man	=	INR 500/person
Woman	=	INR 500/person

OR

IX.   Calculate unit rate for concrete 1:4:8 flooring, based on the following data and rate. Add 5% overload charge. Assume any appropriate data, if found necessary.

Data:
40 mm broken stone	=	0.85 m^3
Cement	=	160 kg/ m^3
Sand	=	0.5 m^3/ m^3
Mason	=	0.1 Nos./ m^3
Man	=	1 No./ m^3
Woman	=	1.40 Nos./ m^3

Material Rates		
Blasted rubble	=	INR. 311/ m^3
Sand	=	INR. 600/ m^3
Manufactured sand	=	INR. 1200/ m^3
Cement	=	INR. 5940/tonne
Labour Rates		
Mason	=	INR 800/person
Man	=	INR 500/person
Woman	=	INR 500/person
Conveyance		
Blasted rubble	=	INR 424/ m^3
Broken stone	=	INR 424/ m^3
Manufactured sand	=	INR 218/ m^3
Cement	=	INR 323/ton

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PLAN

SECTION-AA

- FLOOR FINISH 2 THICK
- FLOOR CONCRETE 8 THICK
- RAMMED EARTH FILL

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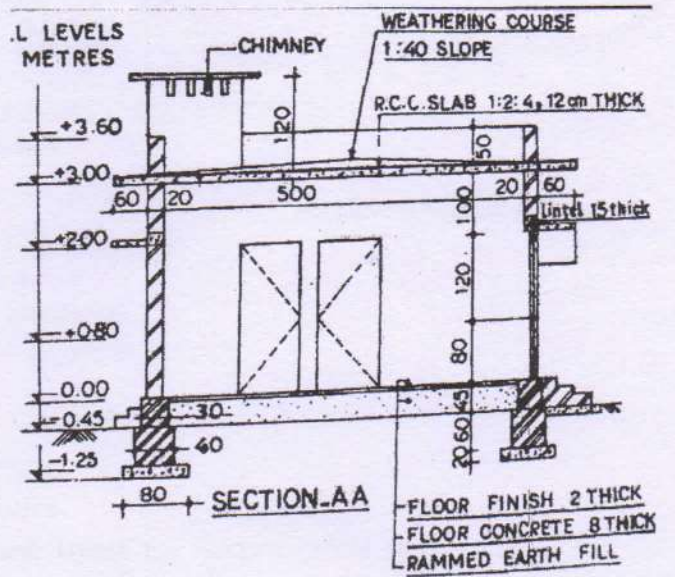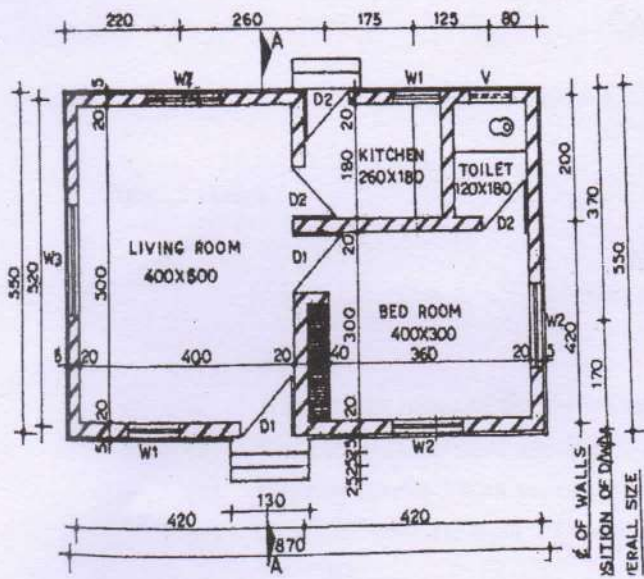
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AR 1407 BUILDING SERVICES – I (WATER SUPPLY AND SANITATION)
(2014 Scheme)

Time: 3 Hours   Maximum Marks: 100

PART A
(Answer **ALL** questions)

$(8 \times 5 = 40)$

I. (a) List the factors governing selection of source of water.
    (b) Enumerate requirements of a good distribution system.
    (c) Explain the various systems of sewage disposal.
    (d) Mention five differences between combined and separate system.
    (e) Write short note on sewage breakdown.
    (f) What are the factors to be considered while designing a septic tank?
    (g) Give a brief description on grease traps.
    (h) Write a short note on rain water harvesting.

PART B

$(4 \times 15 = 60)$

II. Give the approximate breakdown for various purposes in a water supply scheme for a city, if the average daily demand is 300 litres. Also give a brief description on any two layouts of water distribution networks.

OR

III. Write in detail about various (i) plumbing systems (ii) valves.

IV. Design the dimensions of a septic tank for a small colony of 180 persons provided with an assured water supply from municipal head-works at a rate of 120 l/h/d. Also design a soak well for the septic tank if percolation rate is assumed to be 1250 l/m³/d.

OR

V. Write in detail the methods of estimating maximum rate of storm run-off.

VI. Explain the process of laying of sewers. Also mention the different methods of ventilation of sewers.

OR

VII. Explain in detail about the different methods of disposal of effluents from septic tank with neat sketches.

VIII. Write the principles regarding house drainage system. Also mention the different types of traps used in a drainage system.

OR

IX. Elaborate on the Indian Standards of fire protection requirements 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 two basic methods of analysing statically indeterminate structures.

(b) Write a short note on unit load method.

(c) Determine the lengths of the overhangs for a continuous beam shown in figure so that the moments over the supports will be equal.
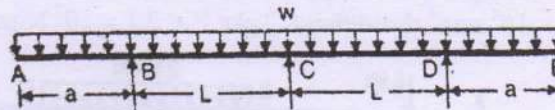
(d) Enumerate the assumptions made in slope-deflection method.

(e) Write the procedure involved in moment distribution method.

(f) Write short note on carryover moment.

(g) What are the causes of side sway in portal frames?

(h) What are the advantages of Kani's method?

PART B

$(4 \times 15 = 60)$

II. A cantilever of span L is propped at the free end. Calculate the reaction components if it carries a UDL of w per unit length.

OR

III. Determine the reaction components in the beam shown below. EI is constant throughout.
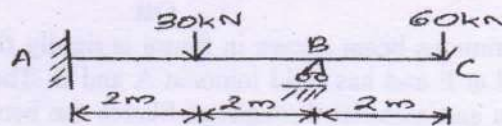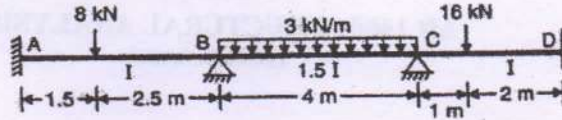

IV. A continuous beam ABCD covers three spans, AB = 1.5 L, BC = 3 L and CD = L. It carries uniformly distributed loads of 2w, w and 3w per metre run on AB, BC and CD respectively. If the girder is of the same cross-section throughout, find the bending moments at supports B and C and the pressure on each support. Also plot the B.M and S.F diagram.
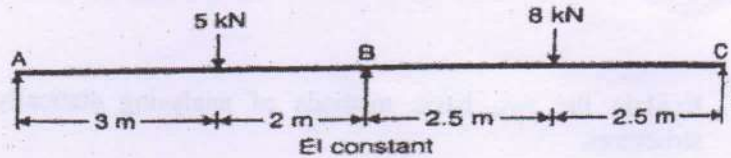
OR

(P.T.O.)

V. A continuous beam ABCD is fixed at ends A and D, and is loaded as shown in figure. Spans AB, BC and CD have moments of Inertia of I, 1.5 I and I respectively and are of the same material. Determine the moments at the supports and plot the BMD.
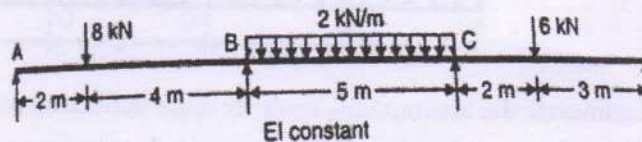

VI. Determine the support moments and draw the BMD for the continuous beam shown in figure.

OR

VII. A beam ABCD, 16 m long is continuous over three spans and is loaded as shown in figure. The support B sinks by 5 mm downwards. I for the beam is 93×10^4 mm^4 throughout. Take $E = 2.1 \times 10^5$ N/mm^2.

VIII. Draw the bending moment diagram and sketch the deflected shape of the frame shown in figure. The ends A and D are fixed and BC is loaded with U.D.L of 6 kN/m.
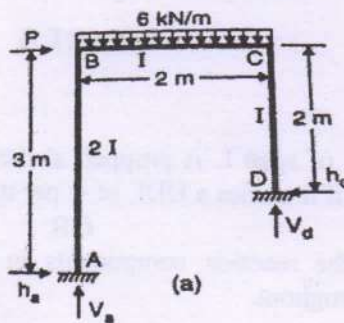
OR

IX. A continuous beam shown in figure is rigidly fixed at ends C and D, and pinned at E and has rigid joints at A and B. The members are of uniform section and material throughout. Sketch the bending moment diagram for the frame, showing all important values. Also, find the values of the horizontal and vertical reactions at D and E. Use Kani's method.

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