B.Arch-IV-04.21-0239   Reg. No. ⬚⬚⬚⬚⬚⬚⬚⬚   **C**

# B.Arch. Degree IV Semester Examination April 2021

## AR 1402 BUILDING MATERIALS AND CONSTRUCTION III
*(2014 Scheme)*

Time: 4 Hours                                                           Maximum Marks: 100

### PART A
(Answer *ALL* questions)

(8 × 5 = 40)

I.      Write short notes on the following.
(a)   Mechanical treatment of steel
(b)   Anti corrosive measures for steel
(c)   North light truss
(d)   Rolling shutter
(e)   Aluminium castings
(f)   Aluminium alloys
(g)   Curtain walls
(h)   False ceiling

(2 × 10 = 20)

II.     Briefly explain various structural market forms of steel and indicate their standard sizes and uses in buildings.

**OR**

III.    Explain different types of steel roof trusses.

IV.    Briefly elaborate on the process involved in extrusions, foils, castings of aluminium products.

**OR**

V.      Describe various standard profiles of Aluminum Ventilators.

### PART B

(2 × 20 = 40)

VI.    Draw to a suitable scale a longitudinal section and an enlarged detail of a step showing surrounding connections – steel stringer beams on sides, tread, closed riser, railing, balusters etc. for a straight run steel staircase to mezzanine floor of a shop. Height to mezzanine floor – 240 cm. Use appropriate standard size of M.S. Angles, Channels, Plates, Pipes, tubes etc. Assume any necessary details.

**OR**

VII.   Draw to a suitable scale plan, elevation and section of a steel window for masonry opening size 150 × 140 cm to be fixed to a concrete block masonry. Use standard steel product profiles. Brief description and full dimensions of parts are to be given in the drawing. Assume necessary data required for the drawing.

VIII.  Draw to a suitable scale, detailed plan and section of an aluminum door of size 110 x 210 cm for an office. Use standard profiles. Detail out the jamb fixing method to a blown up scale. Brief description and full dimension of parts have to be given in the drawing. Assume necessary details required for the drawing.

**OR**

IX.    Draw to a suitable scale, detailed plan and section of an aluminum casement window of size 120 × 180 cm for a class room. Use standard profiles. Brief description and full dimension of parts have to be given in the drawing. Assume necessary details required for the drawing.

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# B.Arch. Degree IV Semester Examination April 2021

## AR 1403 HISTORY OF ARCHITECTURE III

*(2014 Scheme)*

Time: 3 Hours                                                      Maximum Marks: 100

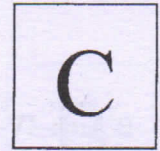### PART A
(Answer **ALL** questions)

(8 × 5 = 40)

I.        Write short notes on the following.
- (a)    Flying buttresses.
- (b)    Clerestory.
- (c)    Gothic Vaults.
- (d)    Pinnacles.
- (e)    Mayan Temples.
- (f)    Horse shoe arch.
- (g)    Shinto shrines.
- (h)    Forbidden city.

### PART B

(4 × 15 = 60)

II.       Explain salient features of early Christian architecture. Elaborate the answer with a detailed sketch of an Early Christian church.

**OR**

III.      Elaborate on the techniques adopted to construct domes in byzantine period taking Hagia Sophia as an example.

IV.      Enumerate the features of French gothic style taking the case of Notre dame as an example.

**OR**

V.       Explain the following.
- (i)    Characteristics of renaissance architecture.
- (ii)   Features of rococo architecture.
- (iii)  Palladian style of architecture.

VI.      'Moorish Architecture reached its peak with construction of the magnificent Alhambra complex at Granada'. Justify.

**OR**

VII.     Explain the architectural features of great mosque of Cordova.

VIII.    Outline the planning concepts of Temple of Angkor wat, Cambodia and describe its architectural characteristics.

**OR**

IX.      Explain the characteristics of Chinese architecture and Japanese architecture.

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# *B.Arch. Degree IV Semester Examination April 2021*

## 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)

                                                       $(8 \times 5 = 40)$

I.      Write short note on:
- (a)   Significance of time in landscape design.
- (b)   Topiary Garden.
- (c)   Purpose of sculpture in Landscape design.
- (d)   Natural and Manmade elements.
- (e)   Drip Irrigation system.
- (f)   Concept of Cutting and filling .
- (g)   Potting and repotting.
- (h)   Mention and brief the Criteria for Plant selection.

### PART B

                                                       $(4 \times 10 = 40)$

II.      *"The Mughal Gardens were considered as Earthly depiction of blissful paradise Garden"*. Justify the Statement by referring Taj Mahal as Tomb Garden.

                                            **OR**

III.     Compare and analyze the features of Japanese Garden and Chinese Garden.

IV.    (a)   Visual and Non visual characteristics help someone to appreciate the landscape design as a whole. Justify .
       (b)   Relation between Time and Climate in landscape.

                                            **OR**

V.      Explain the importance of water in Landscape design with neat Sketches.

VI.     Explain the following with proper sketches
- (i)   Theory of Contour.
- (ii)   Grading in landscape architecture.
- (iii)   Retaining wall.

                                            **OR**

VII.    Define Irrigation system in landscape. Discuss in detail about all the types of irrigation systems.

VIII.   Explain the Classification of Plants based on size.

                                            **OR**

IX.     Importance of planting and transplanting in present global climatic scenario. Explain the techniques adapted to implement it.

B.Arch–IV–04.21–0241

## PART C

$(1 \times 20 = 20)$

X.  Given the site of 70 m × 50 m in front of Administration Complex of institutional building develop an entrance landscape incorporating the element features, principles and circulation. Make a presentation drawing with plan and section in 1:50 scale and details with minimum 2 views. All other information can be assumed.

**OR**

XI.  Impact on Corona virus attack and lock down processes can lead to a situation where there is a scarcity of food supply. Everybody alerts the human race on the same, including Kerala Govt. Solution to this would be taking steps to procure Food for ourselves within the limited space.

A residential plot given here has ample amount of flat space behind the kitchen, i.e. 20 m × 16 m. Design a vegetable garden for a family of 4 where the requirements are as follows.

(i)  Space for min 6 types of vegetables (3 creepers, 3 shrubs, Specify the plants)

(ii)  Circulation space within the garden (bare minimum so that max amount of space could be used for cultivation)

(iii)  Consider the vegetable garden as a place for relaxation, hence seating Spaces to enjoy the garden.

(iv)  Watering method and Warehouse to store the equipments.

(v)  Any other information can be assumed.

Make a presentation drawing with plan and section in 1:50 scale and details with minimum 2 views.

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## PART A
### (Answer **ALL** questions)

$(8 \times 5 = 40)$

I.        Write short notes on the following.

(a)    Sound pressure level.

(b)    Units of measuring sound.

(c)    Sound absorption coefficient.

(d)    Flatter echo.

(e)    Noise criteria curve.

(f)    Noise reduction coefficient.

(g)    Acoustical plaster.

(h)    Sound masking.

## PART B

$(4 \times 15 = 60)$

II.        Briefly explain various properties of sound. Explain using wave diagrams.
### OR
III.        Explain sound resonance and an example of sound resonance.


IV.        Explain the behaviours of sound within an enclosed space.
### OR
V.        Explain Sabine's equation for calculating reverberation time. Tabulate the optimum reverberation time required for major five activity spaces.


VI.        What is air-borne noise? Explain the method of controlling sound transmission through walls and partitions.
### OR
VII.        What are the sources of noise in an open-air auditorium? How noise can be controlled in the auditorium, explain using sketches?


VIII.        Describe the acoustical problems associated with a recording studio design. List out the solutions in terms of planning, design and detailing of the projects.
### OR
IX.        Briefly explain the sound-absorbing material and its application. Also, explain the various methods of mounting.

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# B.Arch. Degree IV Semester Examination April 2021

### 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)   Brief note on need and importance of specification in the field of construction
- (b)   General specification for coarse aggregate
- (c)   General specification for earth work excavation
- (d)   General specification for brick work masonry
- (e)   Types of estimates
- (f)   Units of measurement and types of estimate
- (g)   Bill of quantities and Abstract of estimate
- (h)   Contingencies and conveyance charge

## PART B

$(4 \times 15 = 60)$

II.     Explain the importance of specification in a contract document.

**OR**

III.    General specification for burnt bricks, cement and sand.

IV.    Write the detailed specification for cement concrete for PCC below RR masonry in foundation.

**OR**

V.     Write the detailed specification for RR masonry for plinth at ground level.

VI.    Prepare an estimate of quantities for the items shown below based on the attached drawing. Assume any appropriate data, if found necessary.
- (i)    RR masonry for 45 cm × 45 cm plinth.
- (ii)   DPC course above plinth 45 cm wide.
- (iii)   Brick work in cement mortar 1:6 for 300 cm high walls excluding work area and toilet with lean-to tile roof.
- (iv)   Plastering with cement mortar 1:4 for the interior and exterior of walls.

**OR**

VII.   Prepare an estimate of quantities for the times shown below based on the attached drawing. Assume any appropriate data, if found necessary.
- (i)    RCC roof slab with 75 cm projection around the external walls.
- (ii)   Tile floor finish and skirting for hall.
- (iii)   Wood work for one (D1 type) wooden door frame and wooden shutter.
- (iv)   Quantity of lean to tile roof for the work area and toilet.

**(P.T.O.)**

B.Arch-IV-04.21-0243

VIII.    Calculate the unit rate of CC 1:2:4.

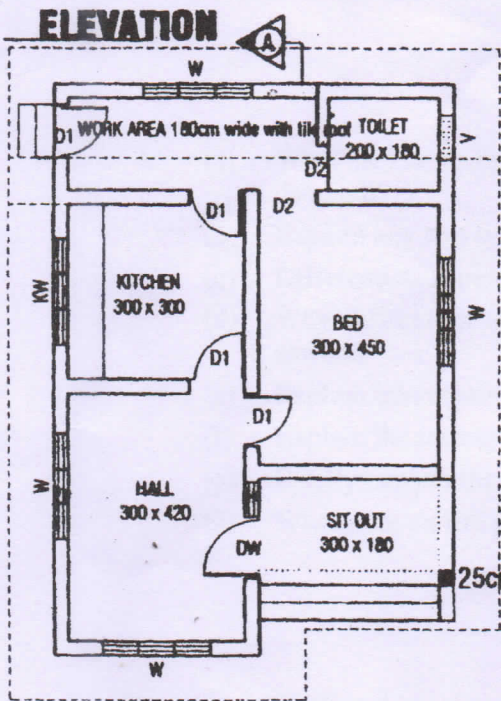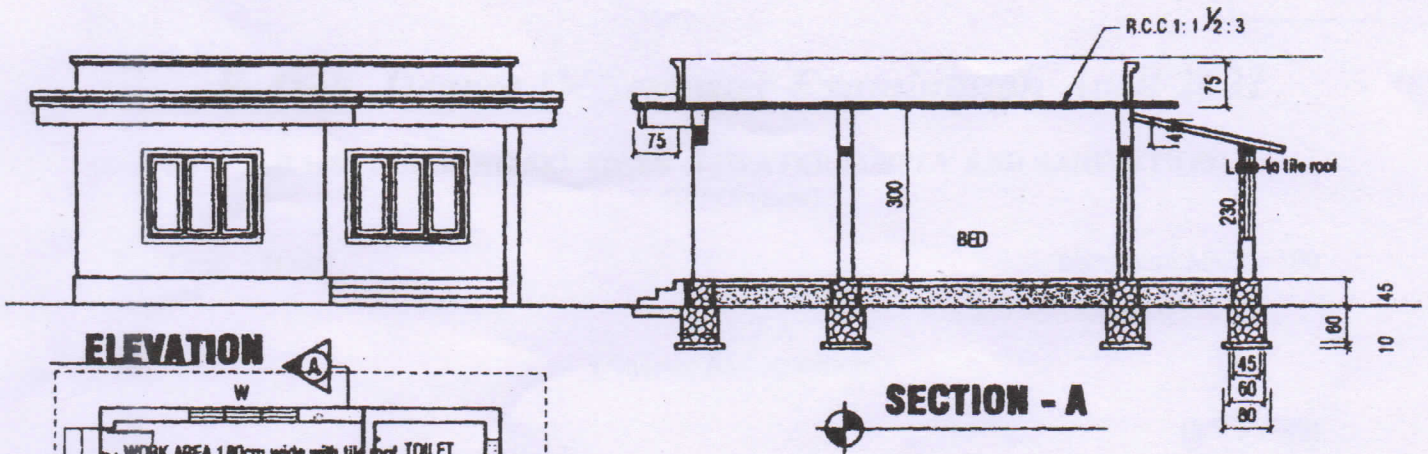| Material | Quantity/ No. | Rate |
|---|---|---|
| Coarse aggregate | 8.4 m$^3$ | 620/m$^3$ |
| Sand | 4.2 m$^3$ | 500/m$^3$ |
| Cement | 2.8 m$^3$ | 420/bag |
| Labour | | |
| Head mason | 0.5 | 500/person |
| Mason | 3 | 450/person |
| Mazdoor | 2.3 | 400/person |

**OR**

IX.    Calculate the unit rate for RR in CM 1:6. Add 5% overhead charge. Assume any other data, if necessary.

Blasted rubble      : 1 m$^3$

Cement      : 72 kg/ m$^3$

Manufactured sand  : 0.3 m$^3$/ m$^3$

Mason      : 0.70 Nos./ m$^3$

Man      : 0.35 Nos./ m$^3$

Woman      : 0.70 Nos./ m$^3$

| MATERIAL RATE | |
|---|---|
| Blasted rubble | ₹311/m$^3$ |
| Broken stone | ₹600/m$^3$ |
| Manufactured sand | ₹1200/m$^3$ |
| Cement | ₹5940/m$^3$ |
| LABOUR RATE | |
| Mason | ₹800/person |
| Man | ₹500/person |
| Woman | ₹500/person |
| CONVEYANCE | |
| Blasted rubble | ₹424/m$^3$ |
| Broken stone | ₹424/m$^3$ |
| Manufactured sand | ₹218/m$^3$ |
| Cement | ₹323/m$^3$ |

**(Continued to 3)**

B.Arch-IV-04.21-0243

**ELEVATION** △A

**SECTION - A** ⊕

R.C.C 1: 1½ : 3

75

300

BED

230

45

60

10

45
60
80

Lean-to tile roof

### GROUND FLOOR PLAN

NTS

**GROUND FLOOR PLAN** (details)

W

D1 WORK AREA 180cm wide with tile roof TOILET 200 x 180

D2

V

KITCHEN 300 x 300

KW

D1

D2

BED 300 x 450

W

D1

HALL 300 x 420

W

D1

SIT OUT 300 x 180

DW

25cmdia.RCC column

W

## SCHEDULE OF OPENINGS

| ITEM | | SIZE | SPECIFICATIONS |
|------|------|------|----------------|
| Door | DW | 165 x 210/180 | Panelled door |
| | DW1 | 225 x 210/180 | Panelled door |
| | D1 | 90 x 210 | Panelled door |
| | D2 | 75 x 210 | P.V.C door |
| Window | W | 180 x 140 | Glazed openable window |
| | KW | 180 x 100 | Glazed openable window |
| | KW1 | 100 x 100 | Glazed openable window |
| Ventilator | V | 75 x 50 | Openable glass ventilator |

Figure for Qn. Nos. VI and VII.

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# *B.Arch. Degree IV Semester Examination April 2021*

### 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.   (a)  What is Per capita demand? What are the factors affecting per capita demand?

   (b)  Explain any two types of valves with neat sketches.

   (c)  Differentiate separate system and combined system of sewage flow.

   (d)  Why infiltration and runoff calculations are important in the design of sewers?

   (e)  Explain intercepting chambers and inspection chambers with a neat sketch.

   (f)  Explain the testing of sewers.

   (g)  Briefly explain the Indian standards for sanitary convenience.

   (h)  Write note on fire protection of buildings.

## PART B

(4 × 15 = 60)

II.    Explain the various water distribution networks with neat sketch.

**OR**

III.   Explain the various plumbing systems.

IV.   Design a septic tank for a small colony of 250 persons provided with an assured water supply from municipal head works at 120 *L*pd. Also draw a neat sketch of the septic tank designed. (Assume any data needed).

**OR**

V.    What are the factors affecting the design of sewers? Explain in detail the shapes of sewers with neat sketches.

VI.   Explain in detail the process of self-purification in sewage treatment.

**OR**

VII.  Explain with sketches the constructional details of an Imhoff tank.

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

**OR**

IX.   What is a trap? What are the requirements of a trap? Explain different types of traps with a neat sketch.

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Reg. No. ☐☐☐☐☐☐☐ ☐ A

# B.Arch. Degree IV Semester Examination April 2021

## AR 1408 STRUCTURAL ANALYSIS II
### (2014 Scheme)

Time : 3 Hours                                                                                    Maximum Marks : 100

### PART A
#### (Answer ALL questions)

$(8 \times 5 = 40)$

I.   (a)  Differentiate between determinate and indeterminate beams?
     (b)  Write down the steps in slope deflection method.
     (c)  Define the distribution factor for different support conditions?
     (d)  Write down the steps of constituent deformation method?
     (e)  How to find the bending moment diagram using the theorem of three moments?
     (f)  Write notes on principle of super position.
     (g)  Write short notes on sway analysis of frames.
     (h)  Write down the steps in Kani's method?

### PART B

$(4 \times 15 = 60)$

II.   Draw the shear force and bending moment diagram  by constituent deformation method. EI is constant.
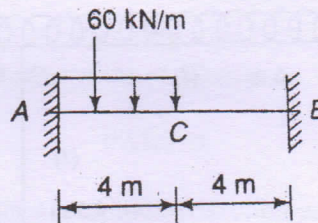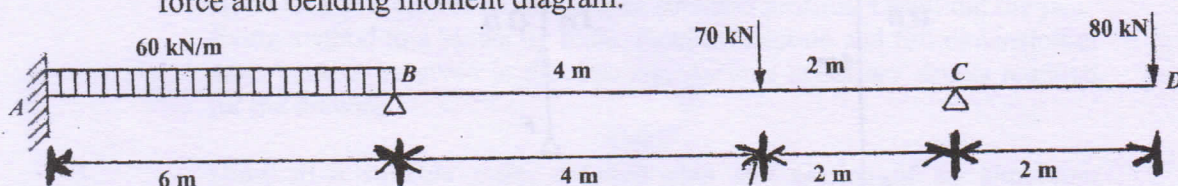


**OR**

III.  Draw the shear force and bending moment diagram  by constituent deformation method. EI is constant.
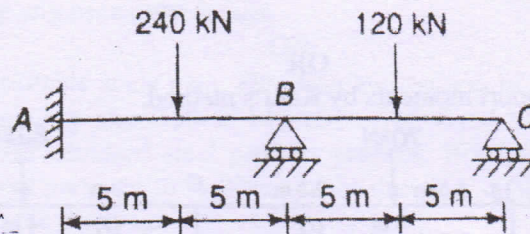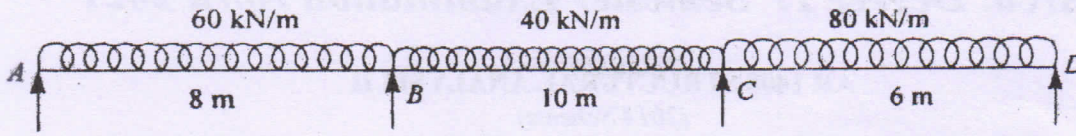


IV.   Analyze the continuous beam by slope deflection method , draw shear force and bending moment diagram.
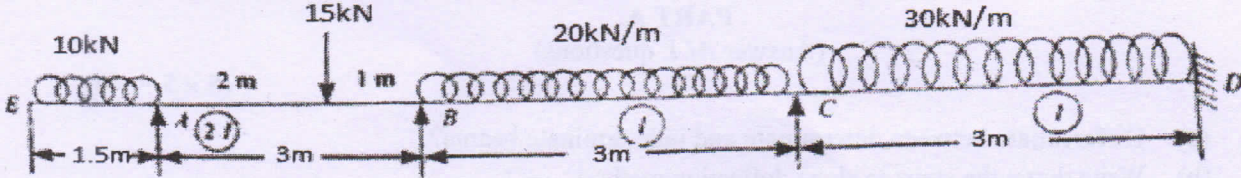


**OR**

(P.T.O)

V.        Analyze the continuous beam by theorem of three moments draw shear force and bending moment diagram.
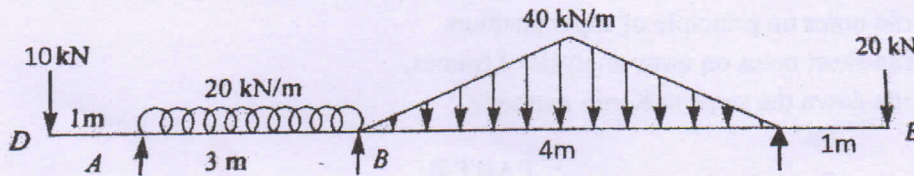


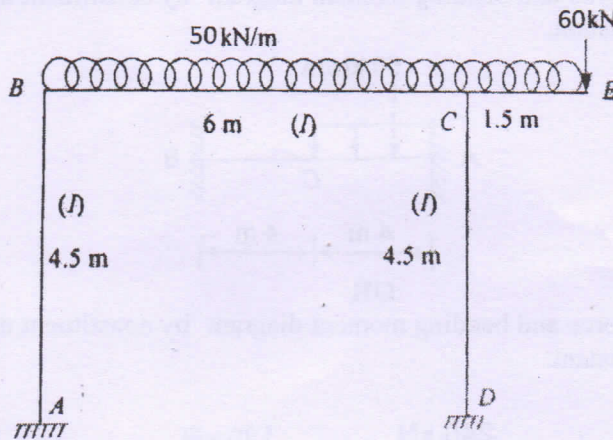VI.      Analyze the continuous beam by moment distribution method, draw the shear force and bending moment diagram.



**OR**

VII.     Analyze the continuous beam by moment distribution method, draw the shear force and bending moment diagram.



VIII.    Analyze the frame by moment distribution method, draw shear force and bending moment diagram



**OR**

IX.      Determine the support moments by Kani's method.



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