C 82680

FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2017 SCHEME) EXAMINATION APRIL 2020

AR 17 17—VISUAL ARTS AND PRESENTATION

Time : Three Hours
Maximum : 100 Marks

Answer **all** *questions.*
Support you answers with neat sketches, wherever appropriate.
Drawing sheets will be provided.

Part A

Answer **all** *questions.*
Each question carries 5 marks.

1. Write short notes on :

    (a) Impressionism and its characteristic features.

    (b) Calligraphy and its applications.

    (c) Techniques of shading with neat sketches.

    (d) How does sociography adds value to the elevation and view of a building ?

    (e) Colour wheel.

    (f) Effects of using various lenses / filters in photography of buildings.

    (g) Relief sculpture and its types.

    (h) Mural tradition in Kerala.

    (8 × 5 = 40 marks)

Part B

Answer **all** *questions.*
Each question carries 30 marks.

2. (a) Elaborate on cubism and surrealism with examples and neat sketches.

    Or

    (b) Make the logo of an industry producing harmful gases in the residential area to warn them.

3. (a) Design a free standing sculpture in fiber glass for an Institution campus. Explain its theme and molding techniques.

    Or

    (b) Draw a mural to be hung in the children's room using shapes of your own choice. Colour suitably according to the theme you've chosen.

    (2 × 30 = 60 marks)

Name..

Reg. No....................................

FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2017 SCHEME) EXAMINATION, APRIL 2020

AR 17 16—ARCHITECTURAL DRAWING AND GRAPHICS

Time : Three Hours
Maximum : 100 Marks

Missing data if any, may suitably be assumed.
Retain construction lines, dimension the figures appropriately.

Part A (25 marks)

I. a) i) List down the various types of lines used in architectural drawings. Sketch and write down its general applications.

(12.5 marks)

ii) Draw a Vernier scale of R.F. = to read centimetres upto 4 metres and on it, show lengths representing 2.39 m and 0.91 m.

(12.5 marks)

Or

b) i) Draw a parabola of base 100 mm and axis 50 mm if the axis makes 70° to the base.

(12.5 marks)

ii) Draw an ellipse having the major axis 70 mm and the minor axis of 40 mm.

(12.5 marks)

Part B (25 marks)

II. a) i) Construct a regular heptagon of 25 mm side and inscribe a circle in it.

(12.5 marks)

ii) Draw an involute of a circle of 40 mm diameter. Also, draw a normal and a tangent to it at a point 100 mm from the circle.
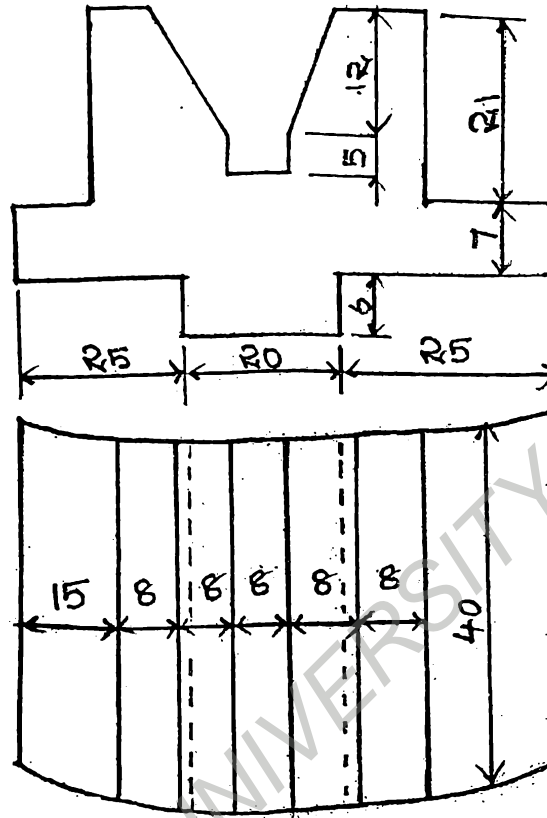
(12.5 marks)

Or

b) i) A square ABCD of 50 mm side has its corner A in the H.P., its diagonal AC inclined at 30° to the H. P. and the diagonal BD inclined at 45° to the V.P. and parallel to the H.P. Draw its projections.

(12.5 marks)

ii) Draw the projections of a pentagonal prism, base 25 mm side and axis 50 mm long, resting on one of its rectangular faces on the H. P. with the axis inclined at 45° to the V.P.

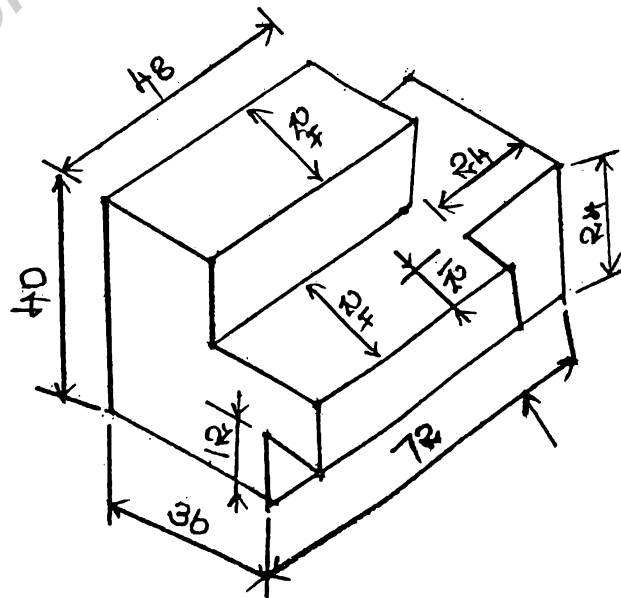(12.5 marks)

Turn over

Part C (25 marks)

III.   a)   Draw the isometric view of the casting shown in figure.

Or

b)   Draw the top, front and sides of the block shown below. Use third angle projection method.

Part D (25 marks)

IV. a) i) A hexagonal prism having the side of base 26 mm and the height of 60 mm is resting on one of the corner of the base and its axis is inclined to 30° to the H. P . Draw its projections and also prepare the isometric view of the prism in the above stated condition.

(12.5 marks)

ii) A rectangular block, 30 mm × 20 mm × 15 mm, is lying on the ground plane on one of its largest faces. A vertical edge is in the picture plane and the longer face containing that edge makes an angle of 30 with the picture plane. The station point is 50 mm in front of the picture plane and lies in a central plane which passes through the centre of the block. Draw the perspective view of the block.
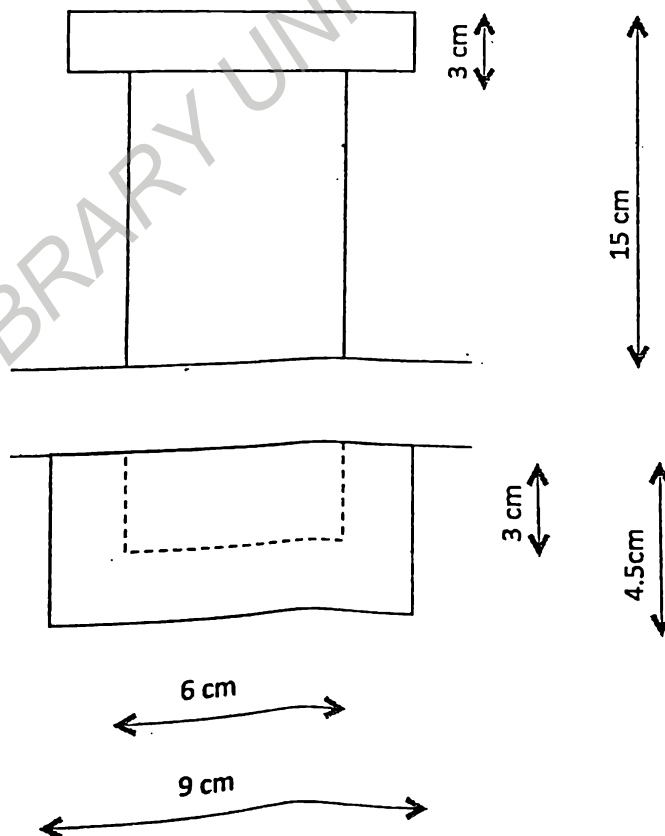
(12.5 marks)

Or

b) Draw sociography for the following. Assume any other details required.

(i) Draw the sociography both in plan and in elevation for a square prism of side 5 cm and height 8 cm placed on the ground making an angle of 60° to the wall. The prism is placed 3 cm away the vertical plane, i.e., wall.

(12.5 marks)

(ii) Draw the sociography for the object given below.

(12.5 marks)

FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2017 SCHEME) EXAMINATION, APRIL 2020

AR 17 15—HISTORY OF ARCHITECTURE—I

Time : Three Hours   Maximum : 100 Marks

Answer **all** *questions.*
Illustrate with neat sketches wherever required.

Part A

Write short note on :

(a) The Acropolis at Greece.

(b) The Ishtar Gate.

(c) Ajanta Caves.

(d) Streets of Indus Valley.

(e) Shore Temple, Mahabalipuram.

(f) Durga Temple.

(g) Features of Khajuraho temples.

(h) Rameshwaram Temple.

(8 × 5 = 40 marks)

Part B

Answer **all** *questions.*
Each question carries 15 marks.

1. Describe the Pyramid Complex at Giza.

Or

Explain the Colosseum at Rome with sketches.

2. Explain the Chaityas and Viharas in Buddhist Architecture.

Or

Explain the construction techniques in Vedic Villages.

Turn over

3. Explain the features of Chola Temple Architecture with an example.

Or

Explain the evolution of Gopurams.

4. Explain the typical features of Gujrat Temples.

Or

Explain the features of Orissan temples.

(4 × 15 = 60 marks)

FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2017 SCHEME) EXAMINATION, APRIL 2020
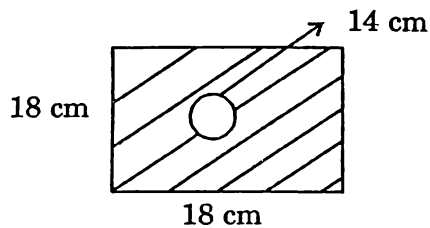
AR 17 14—THEORY OF STRUCTURES—I

Time : Three Hours   Maximum : 100 Marks

Part A

*Answer **all** questions.*
Each question carries 5 marks.

I. (a) Define Concurrent forces.

   (b) State Lami's theorem.

   (c) Find moment of inertia of the shaded region about horizontal axis and vertical axis.
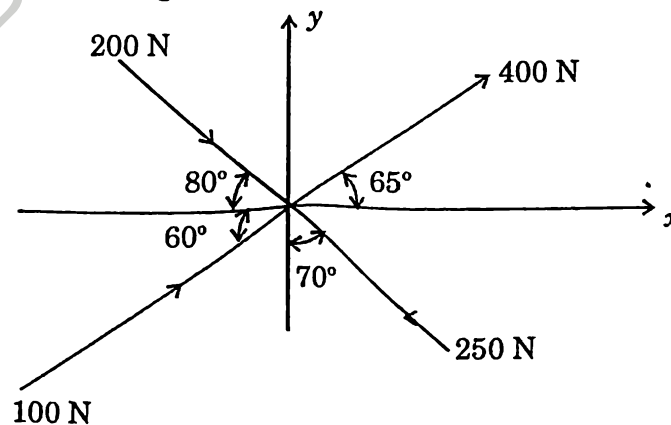

   (d) Give the classification of loads.

   (e) What is meant by centre of gravity ?

   (f) State Parallel Axis theorem.

   (g) Differentiate between Simply supported beam and Cantilever beam.

   (h) State the condition of equilibrium for beams.

(8 × 5 = 40 marks)

Part B

*Answer **all** questions.*
Each question carries 15 marks.
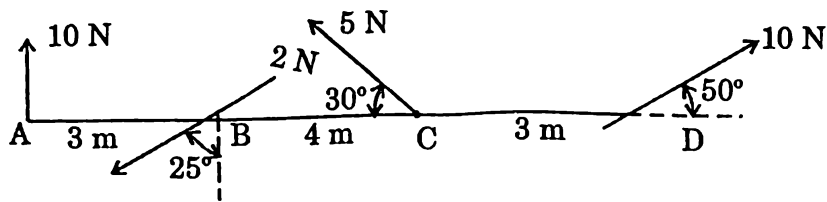
II. (a) Calculate the resultant of given concurrent forces.

Or
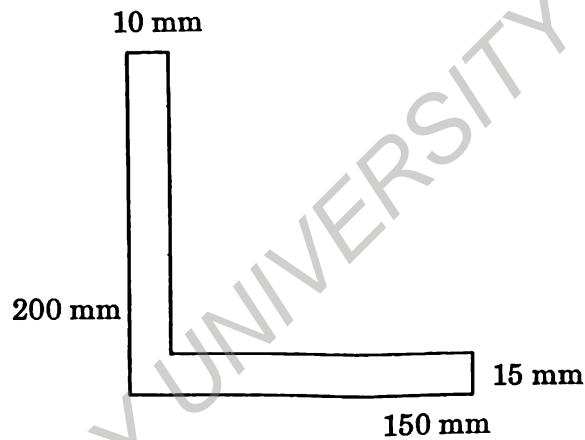
(b) Calculate the moment at point A.

III. (a) A pull of 100 N at 25° to horizontal is required to just move a block of weight W. Calculate *w* if μ = 0.30.

Or

(b) Calculate centroid of given section as shown in figure.

IV. (a) Analyse the truss by method of joints.
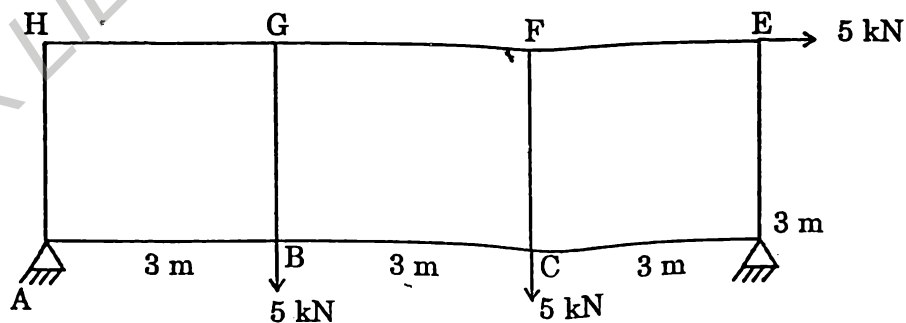
Or

(b) Analyse the truss by method of joints.

V. (a) Calculate the shear force and bending moment diagram of simply supported beam with uniformly distributed load as shown in figure.

Or

(b) Analyse the shear force and bending moment diagram of a overhanging beam with uniformly distributed load as shown in figure.

(4 × 15 = 60 marks)

FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2017 SCHEME) EXAMINATION, APRIL 2020

AR 17 13—BUILDING MATERIALS AND CONSTRUCTION—I

Time : Three Hours　　　　　　　　　　　　　　　　　Maximum : 100 Marks

Answer all questions.
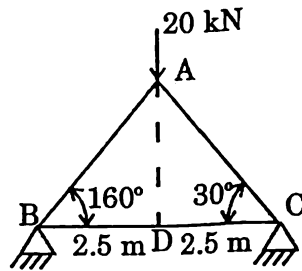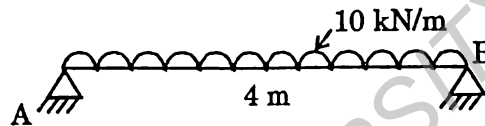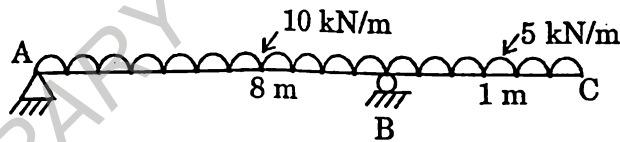*Illustrate your answers with neat sketches wherever required.*

Part A

Answer all questions.
Each question carries 5 marks.

I. Write short notes on :

    (a)　Naturally occurring building materials.

    (b)　Represent brick, stone, wood, rcc, earth on plan.

    (c)　Raft foundation.

    (d)　Combined footing.

    (e)　Natural bed, corbel, course, cornice, throating in stone masonry.

    (f)　Classification of arches based on shape.

    (g)　Mud and bamboo wall.

    (h)　COB wall.

                                (8 × 5 = 40 marks)

Part B

II. (a)　Differentiate load bearing structure and framed structure.

Or

    (b)　What are the various uses of timber and explain how seasoning of timber is carried out.

III. (a)　How to increase the bearing capacity of soil.

Or

    (b)　Write notes on cantilever footing, continuous footing and foundation near existing adjacent old structure.

Turn over

IV. (a) Explain dressing of stone surfaces and describe 10 types of surface finish.

Or

(b) Draw plan and elevation of English bond of 1 and 1½ bricks wall thickness to a suitable scale.

V. (a) What are the steps involved in preparing adobe bricks ? Explain with sketches.

Or

(b) Draw various joints and roof covering using bamboo as a building material.

(4 × 15 = 60 marks)

FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2017 SCHEME) EXAMINATION APRIL 2020

AR 17 12—THEORY OF DESIGN—I

Time : Three Hours   Maximum : 100 Marks

Answer **all** *questions.*
Illustrate your answer with neat sketches.

Part A

Answer **all** *questions.*
Each question carries 5 marks.

1. Write short notes on the following :

    (a) Illustrate through a sketch the term symmetry.

    (b) What is datum explain with a sketch.

    (c) What is scale and proportion.

    (d) List any *two* issues to be considered in planning circulation inside a building.

    (e) Name any four articulation elements in a building.

    (f) What do you mean by adjoining spaces ? Give example.

    (g) What is the role of vertical circulation in building design.

    (h) List three ways in which a building is experienced.

    (8 × 5 = 40 marks)

Part B

Answer **all** *questions.*
Each question carries 15 marks.

2. (a) Illustrate the characteristics of a pyramid and a cylinder with its derivatives with respect to the evolution of architectural form and space.

    Or

    (b) Explain in detail about the properties and the importance of the elements of architecture.

    (15 marks)

Turn over

3. (a) Explain any *four* proportioning systems used in architecture.

Or

(b) What are the ways in which circulation can be used as an organising element in design ? Explain with sketches and diagram.

(15 marks)

4. (a) Take a well known example and explain its various components of circulation and how it contributes to the architectural experience.

Or

(b) Make a brief check list that you will make before doing a case study.

(15 marks)

5. (a) Explain the various aspects of design through the example of Falling water by F.L. Wright.

Or

(b) Explain massing and circulation in any one of Le Corbusier's work in architecture.

(15 marks)

[4 × 15 = 60 marks]

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FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2012 SCHEME) EXAMINATION, APRIL 2020

AR 12 17—VISUAL ARTS AND PRESENTATION

Time : Three Hours   Maximum : 100 Marks

Illustrate your answers with neat and relevant sketches.

Part A

Answer all questions.
Each question carries 5 marks.

I. Write short notes on :

   (a) Collage.

   (b) Impressionism.

   (c) Texture techniques.

   (d) Conveying depth through shading.

   (e) Elements of painting.

   (f) Harmonious colour combinations.

   (g) Kerala mural paintings.

   (h) Form in painting.

(8 × 5 = 40 marks)

Part B

II. (a) Design a logo of size 10 × 10 cm for a dance troupe using rectangles, triangles, circles or a combination of these shapes. Explain why your logo represents the spirit of dance.

Or

   (b) What are the different types of lines and what are their visual impacts ? How do these change with different media ?

(30 marks)

III. (a) Draw a black and white illustration emphasising the theme depth horizontally or vertically.

Or

   (b) Explain the Gestalt theory in detail giving examples of its application in Art.

(30 marks)

[2 × 30 = 60 marks]

FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2012 SCHEME) EXAMINATION, APRIL 2020

AR 12 16—ENGINEERING MECHANICS

Time : Three Hours　　　　　　　　　　　　　　　　　　Maximum : 100 Marks

Part A

*Answer **all** questions.*
Each question carries 5 marks.

1. Describe briefly on :

    (a) Moment and Couple.

    (b) Parallel axis theorem.

    (c) Force systems. Conditions for equilibrium for coplanar concurrent system.

    (d) Varignon's theorem and its applications.

    (e) Truss. Difference between plane truss and space truss.

    (f) Assumptions made for truss analysis.

    (g) D'Alembert's principle with a suitable example (Assume required datas).

    (h) Work, Energy and Power (with suitable equations).

    (8 × 5 = 40 marks)

Part B

*Answer **all** questions.*
Each question carries 15 marks.

2. (a) A dam is subjected to three forces, 50 KN force on the upstream vertical face AB, 30 KN force on the downstream inclined face and its own weight 120 KN. Determine the single equivalent force and locate its points of intersection with the base AC, assuming all the forces to lie in the same plane as shown in figure.
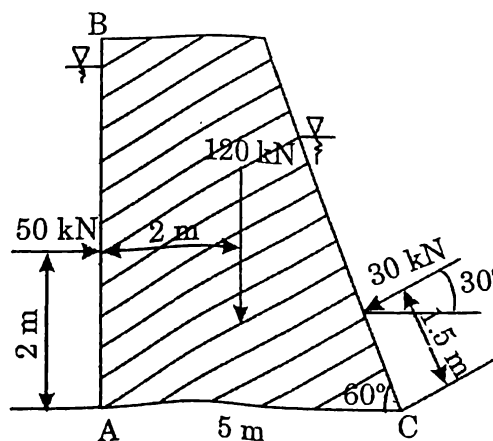
Or　　　　　　　　　　　　　　　　　　　　　　　**Turn over**

(b) Locate the centroid of the area as shown in figure.
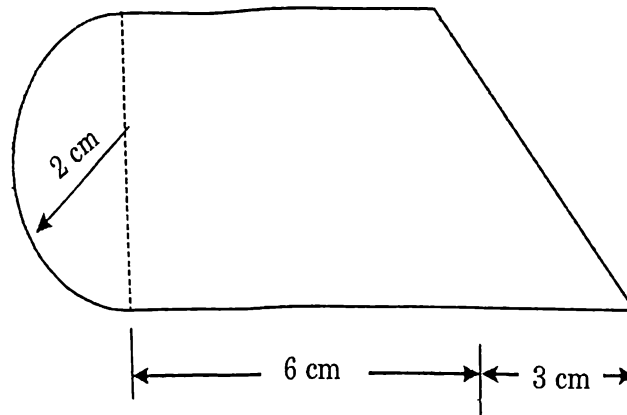
3. (a) Determine the polar moment of inertia of asymmetrical I section with top flange of 100 mm. × 8 mm. Web of 150 mm. × 15 mm. and bottom flange of 150 mm. × 10 mm.

Or

(b) Explain the various problems associated with beams. Also write a detailed note on the types of supports and loading commonly seen in beam problems.

4. (a) Using any *one* method analyse the given system to determine the forces in each member.
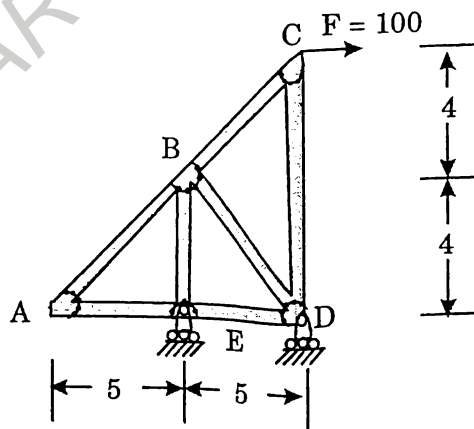
Or

(b) Define Principle of virtual work. Explain in detail the application of virtual works in beams.

5. (a) Explain the motion of vehicles in curved path with suitable diagram. If the co-efficient of friction between the road and tyre of an automobile is 0.2. Then find the speed at which the automobile can travel around a curve of radius 240 m. without skidding.

Or

(b) The rectangular components of a particle moving in a curved path is given by $v_x = 2t - 3$ and $v_y = 3t^2 - 12t + 12$. The co-ordinates of a point on the path at an instant, $t = 0$ are $(4, -8)$. Establish the equation of path.

(4 × 15 = 60 marks)

FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2012 SCHEME) EXAMINATION, APRIL 2020

AR 12 15—THEORY OF DESIGN—I

Time : Three Hours   Maximum : 100 Marks

Illustrate your answers with neat and relevant sketches.

Part A

*Answer **all** questions.*
Each question carries 5 marks.

1. Write short notes on :

    (a) Additive form.

    (b) Architectural examples of centralised spatial organisation.

    (c) Axis.

    (d) Balance.

    (e) Circulation in dining space of restaurant.

    (f) Stairways as a form of circulation space.

    (g) Subtractive as a formative idea.

    (h) Massing in Frank Lloyd Wright's Guggenheim Museum.

    (8 × 5 = 40 marks)

Part B

*Answer **all** questions.*
Each question carries 15 marks.

1. (a) Describe the ways in which form can be articulated.

    Or

    (b) Describe the vertical space defining elements.

2. (a) Explain the role of scale and proportion in architectural design.

    Or

    (b) Explain Emphasis as a principle of composition. Give examples.

Turn over

3. (a) Describe the various configuration of paths.

Or

(b) Explain entrances as an element of circulation.

4. (a) What are formative ideas ? Explain plan to section/elevation as a formative idea.

Or

(b) Analyse Le Corbusier's Villa Savoye in terms of massing and circulation.

(4 × 15 = 60 marks)

FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2012 SCHEME) EXAMINATION, APRIL 2020

AR 12 14—ARCHITECTURE DRAWING AND GRAPHICS

Time : Three Hours   Maximum : 100 Marks

Module 1

1. a) Write any ten terminologies and their abbreviation used in Architectural drawing. (10 marks)

   b) Sketch any ten material representation used in Architectural drawing.   (15 marks)

Or

2. What are the different types of Architectural drawing ? In what way each drawing is different each other and state its salient features with suitable examples.

[1 × 25 = 25 marks]

Module 2

3. Describe different types of scales with suitable examples.

Or

4. a) Bring out the purpose of measure drawing.   (5 marks)

   b) Explain through sketches the process involved in measure drawings.   (15 marks)

   c) Sketch the any five architectural representations of building components referred in your case studies.

(5 marks)

[1 × 25 = 25 marks]

Module 3

5. a) Explain the different position of solid and steps in drawing its projections.

(10 marks)

   b) sketch the different types of pyramid.   (5 marks)

   c) Explain the theory of projections.   (10 marks)

Or

6. a) What is the need to study about the projection of straight lines ?   (5 marks)

   b) The vertices of A, B, C of a triangle are 40mm, 30mm and 60mm above the HP respectively. They are 50mm, 40mm and 70mm in front of the VP respectively. The distance between the extreme projectors from A and C is 60mm. The projector through B is at 40mm from that through A between extreme ones. Find the true shape of the triangle ABC and determine the true length of the sides.

(20 marks)

[1 × 25 = 25 marks]

Turn over

Module 4

7. a) Differentiate between the shade and shadow with suitable examples.   (5 marks)

    b) Draw the sociography in plan and elevation of room size 3m × 4.5m and position the door, windows, steps where ever necessary.

                                                                                              (20 marks)

Or

8. a) Define the development of surfaces and its practical application.   (5 marks)

    b) Draw the isometric view of a cone of base diameter 50mm and height 90mm when its axis is horizontal and base vertical.

                                                                                               (5 marks)

    c) A hexagonal prism of base edge 30mm and height 55mm rests on HP on its base with two of its rectangular faces perpendicular to the VP. It is cut by a plane hose VT is inclined at 30° to XY cutting the axis of the prism at a height of 50mm from its base. Draw the isometric view of the truncated prism.

                                                                                              (15 marks)
                                                                                        [1 × 25 = 25 marks]

FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2012 SCHEME) EXAMINATION, APRIL 2020

AR 12 13—HISTORY OF ARCHITECTURE–I

Time : Three Hours   Maximum : 100 Marks

Answer **all** *questions.*
Illustrate your answers with neat sketches wherever required.

Part A

1. Write short notes on :

   a) Classical orders in Parthenon.

   b) Factors that influenced Mesopotamian Architecture.

   c) Cultural influence of Indus valley civilization on built forms.

   d) Architectural features of Rani Gumpha - Udaigiri.

   e) Evolution of temple plan in Hoysala period.

   f) Evolution of temple style during Early Chalukyan period.

   g) Influence of Nayak style in expanding temple complexes.

   h) Provide Detail sketch of Madurai Meenakshi temple.

   (8 × 5 = 40 marks)

Part B

2. (a) Explain the factors that influenced evolution of Agoras in Ancient Greece with examples.

   Or

   (b) Explain Architectural characters of Mayan Architecture.

3. (a) How did culture influence planning of settlement during Vedic period ?

   Or

   (b) Explain the what all forces influenced Bhuddist architecture during Hinayana and Mahayana period.

Turn over

4. (a) Explain the important principles of design and construction in Chalukyan period.

Or

(b) Explain differences between Rock-cut monolithic temples and structural temples of Pallava style.

5. (a) What are the contribution of Pandyans towards temple architecture ? Explain with any two example.

Or

(b) Explain the principles of Design of temple architecture in Orissa through examples.

(4 × 15 = 60 marks)

FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2012 SCHEME) EXAMINATION, APRIL 2020

AR 12 12—BUILDING CONSTRUCTION MATERIALS AND STRUCTURAL SYSTEM—I

Time : Three Hours   Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 5 marks.

Write short notes on :

  (a)   Stoneware materials.

  (b)   Types of bricks.

  (c)   Combined footing.

  (d)   Raft foundations.

  (e)   Rat trap bond.

  (f)   Brick jali.

  (g)   Sliding door.

  (h)   Door latches.

(8 × 5 = 40 marks)

Part B

Answer **all** *questions.*
Each question carries 15 marks.

1. (a)   What are the defects frequently seen in timber ? What are its causes ?

Or

  (b)   What are the classifications of sand ? In what ways is sand used in building construction ?

2. (a)   What are the various loads acting on a foundation ? How do these affect the selection of a suitable foundation ?

Or

  (b)   What are the methods of testing bearing capacity of soil ?

Turn over

3. (a) What are English and Flemish bonds ? What are their merits and demerits ? Sketch a 1 brick wall with a T junction of both bonds.

Or

(b) Give details of any *five* types of mortar including composition and use.

4. (a) Describe the joinery details of a 3 panel wooden door with glass in 2 panels. Assume suitable details.

Or

(b) Sketch any *three* joints used in wooden joinery in doors indicating their position in the door/s.

(4 × 15 = 60 marks)

FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2004 SCHEME) EXAMINATION, APRIL 2020

AR 01 15—ENGINEERING MECHANICS

Time : Three Hours   Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 5 marks.

1. Describe briefly on :

    (a) Mechanics and its areas.

    (b) Method of projection.

    (c) Friction "a necessary evil".

    (d) Maxwell's diagram.

    (e) Forces in space.

    (f) Applications of Virtual work.

    (g) Momentum and Impulse.

    (h) Liner, Circular and Curvilinear types of motion.

    (8 × 5 = 40 marks)

Part B

Answer **all** *questions.*
Each question carries 15 marks.

2. (a) A roller of radius 300 mm and weighing 1000 N is to be pulled over a rectangular block of height 150 mm. Determine (i) the horizontal force required to be applied through the centre O ; (ii) the least force required to be applied through the top end of vertical diameter.

    Or

    (b) A uniform ladder 5 m long weighs 50 kg. It is placed against a vertical wall with which it makes an angle of 45°. The co-efficient of friction between wall and ladder is 0.25 and that between the floor and ladder is 0.35. The ladder in addition to its own weight has to support

Turn over

an additional load of 1000 N at its top end. Find :

(i) The horizontal force P to be applied at the bottom of the ladder to prevent slipping.

(ii) Consider the same if co-efficient of friction for all the surfaces are same.

3. (a) Using any *one* method analyse the given system to determine the forces in each member.
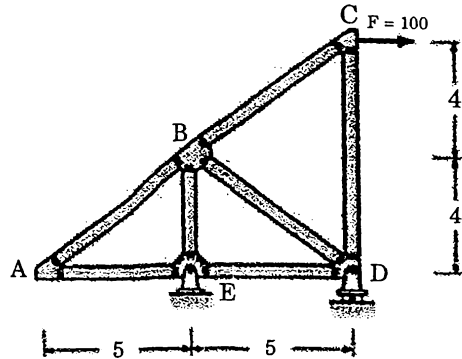
Or

(b) A tripod supports a load of 2 KN as shown in figure. The ends A, B and C are in the X-Z plane. Find the force in the three legs of the tripod.
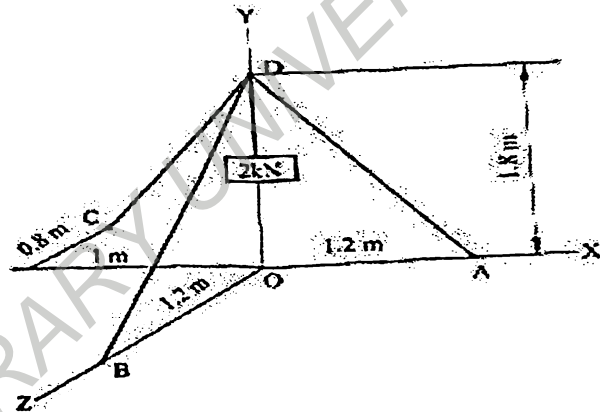
4. (a) Locate the centroid of the area as shown in figure.
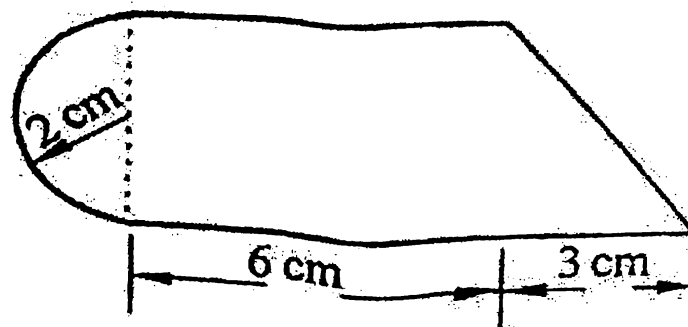
Or

(b) Define Principle of virtual work. Explain in detail the application of virtual works in beams.

5. (a) A car enters a curved road in the form of a quarter of a circle, of radius 150 m at 36 kmph and leaves at 72 kmph. If the car is travelling at a constant tangential acceleration, find the magnitude and direction of acceleration when the car (i) Enters ; and (ii) Leaves the curved portion of the road. Comment on the problem.

Or

(b) Explain angular momentum and angular impulse. Derive mathematical relation for the same.

(4 × 15 = 60 marks)

FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2004 SCHEME) EXAMINATION, APRIL 2020

AR 01 14—ARCHITECTURAL DRAWING AND GRAPHICS

Time : Three Hours

Maximum : 100 Marks

Choose suitable scale and dimension the drawing properly.
Retain all construction lines
*Answer any **two** full questions from each module.*
All questions carry equal marks.
Missing data, if any may be suitably assumed.

Module I

1. List out the various instruments essential for a B. Arch student to carry out architectural drawings and explain the purpose of each.

2. Discuss in detail on symbols, lettering and dimensioning used in the basic architectural drawing.

3. Explain different types of drawings used for architectural applications.

Module II

4. A stone thrown upward travels a horizontal distance of 100 m and reaches the ground. The maximum height reached is 60 m. Trace the path of the stone. Draw a tangent and normal to the curve at a point on the curve 40 m above the ground. Find its focus and directrix.

5. Draw a clockwise Archimedean spiral for one and half convolution. Initial radius 20 mm final radius 170 mm. Draw a tangent and normal to the curve at a radius of 80 mm.

6. Draw a hyperbola when the transverse axis is 100 mm and the abscissa is 60 mm. The double ordinate is 120 mm.

Module III

7. A square pyramid side of base 40 mm and altitude 60 mm is kept with a side of base parallel to VP and the triangular face containing that side of base being vertical. Draw the projections of the pyramid such that the base is visible in the front view.

8. A right regular pentagonal prism edge of base 30 mm and height 75 mm resting on its base on HP is cut by a section plane inclined to the HP at 40° and meeting the axis at a distance of 15 mm from its top end. Develop the outside surface of the cut prism.

Turn over

9. A vertical square prism base side 40 mm is completely penetrated by a horizontal square prism of base side 25 mm so that the axes intersect at 90°. The faces of the two prisms are equally inclined to the VP. Draw the projections of the combinations and show the lines of intersection.

Module IV

10. A hexagonal prism of base 25 mm side and axis 75 mm long is lying on the ground on one of its rectangular faces. A cylinder of 40 mm diameter and axis 50 mm long is located centrally and vertically on the top of the prism. Draw the isometric view.

11. A square prism side of base 40 mm and height 60 mm rests with its base on the ground such that one of its rectangular faces is parallel to and 10 mm behind the picture plane. The station point is 30 mm in front of PP 80 mm above the ground plane and lies in a central plane 45 mm to the right of the centre of the prism. Draw the perspective view.

12. A cylinder of base diameter 75 mm and thickness 20 mm is placed over a square prism of 30 mm sides of base and height 50 mm. Two rectangular vertical faces of the prism are parallel to VP. Draw the plan and elevation. Find the shade and shadow pattern using conventional light direction.

(12.5 × 8 = 100 marks)

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FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2004 SCHEME) EXAMINATION APRIL 2020

AR 01 13—HISTORY OF ARCHITECTURE–I

Time : Three Hours   Maximum : 100 Marks

Illustrate with neat and relevant sketches.

1. (a) Explain how the mosques and churches in Kerala showed the influence of traditional Kerala architecture.

Or

   (b) Explain the planning of traditional residences in Kerala.

(25 marks)

2. (a) The architectural remains of the Indus Valley civilisation shows a highly developed society. Expand on this statement.

Or

   (b) Describe the sociocultural practices in Medieval Europe, highlighting how these were reflected in architecture.

(25 marks)

3. (a) Explain the architecture and construction techniques in Vedic villages.

Or

   (b) Describe the typical features of Jain temples at Mt. Abu.

(25 marks)

4. (a) Describe the Rathas of Mahabalipuram.

Or

   (b) Explain the typical features of the temples of Angkor.

(25 marks)

[4 × 25 = 100 marks]

FIRST AND SECOND SEMESTER B.ARCH. DEGREE (2004 SCHEME) EXAMINATION, APRIL 2020

AR 01 11—MATHEMATICS

Time : Three Hours　　　　　　　　　　　　　　　　　　Maximum : 100 Marks

*Answers **one** full question (A) **or** (B) from each module.*

Module I

A　I. (a)　Find the nth derivative of $\dfrac{x+5}{x^2+2x-3}$.

(4 marks)

　　(b)　If $y = e^{a\sin^{-1}x}$, prove that $\left(1-x^2\right)y_{n+2} - (2n+1)xy_{n+1} - \left(n^2+a^2\right)y_n = 0$.

(6 marks)

　II. (a)　Evaluate $\displaystyle\int_0^{\pi/2} \sin^7 x \cos^5 x \, dx$.

　　(b)　Find the area of the segment cut-off from the parabola $x^2 = 4y$ by the line $y = x$.

(5 + 5 = 10 marks)

Or

B　I.　Find the circle of curvature of $y = e^x$ at $(0,1)$.　　　　　　(10 marks)

　II. (a)　Evaluate $\displaystyle\int \frac{3x+4}{(x-1)(x+2)(x-4)} \, dx$.

　　(b)　Evaluate $\displaystyle\int \frac{x\,e^x}{(x+1)^2} \, dx$.

(5 + 5 = 10 marks)

Turn over

Module II

A   I.   Find the lengths of the axes, centre, eccentricity and co-ordinates of the foci, equations of the directrices of the ellipse $4x^2 + 9y^2 - 8x + 36y + 4 = 0$.

(10 marks)

II.   Show that the tangents at the extremities of a focal chord intersect at right angles on the directrix.

(10 marks)

Or

B   I.   Find the equation to the hyperbola which passes through the point $(2, 3)$ and has the straight lines $4x + 3y - 7 = 0$ and $x - 2y - 1 = 0$ for its asymptotes.

(10 marks)

II.   Find the equations of the tangents to the ellipse $9x^2 + 16y^2 = 144$ from the point $(2, 3)$.

(10 marks)

Module III

A   I.   Calculate the correlation co-efficient for the following data :

X	98	75	92	90	89	91	88	77	81	90
Y	85	87	80	78	76	83	85	76	88	87

(10 marks)

II.   Calculate mean, median and mode from the following :

Marks	0–10	10–20	20–30	30–40	40–50	50–60
Frequency	5	15	10	40	32	3

(10 marks)

Or

B   I.   Calculate the rank correlation co-efficient for the following data :

X	100	110	110	120	122	122	120	122	125
Y :	120	120	160	160	130	131	150	140	121

(10 marks)

II. Calculate Standard Deviation of the following data :

Score	0–10	10–20	20–30	30–40	40–50	50–60	60–70
No. of Students	12	13	23	27	10	10	5

(10 marks)

Module IV

A I. A random variable x has the following probability distribution :

x	0	1	2	3	4	5	6	7	8
$p(x)$	a	$3a$	$5a$	$7a$	$9a$	$11a$	$13a$	$15a$	$17a$

(i) Determine a ; (ii) Find $p(2 \leq x \leq 5)$ and $p(x > 3)$; (iii) Find mean and variance of x.

(10 marks)

II. A sample of 100 dry battery cells tested to find the length of life produced the following results : $\mu = 12$ hours $\sigma = 3$ hours. Assuming the data to be normally distributed, what percentage of battery cells are expected to have life (i) more than 15 hours ; (ii) less than 6 hours ; (iii) between 10 and 14 hours.

(10 marks)

Or

B I. The probability of any ship of a company being destroyed on a certain voyage is 0.02. The company owns 6 ships for the voyage. What is the probability of (i) losing one ship ; (ii) losing atmost one ship ; (iii) losing none ; (iv) losing atleast one ship.

(10 marks)

II. (a) Suppose that x has a Poisson distribution. If $p(x = 2) = \dfrac{2}{3} p(x = 1)$. Find (i) $p(x = 0)$; (ii) $p(x = 3)$.

(b) A certain screw making machine produces on average 2 defective screws out of 100, and packs them in boxes of 500. Find the probability that a box contains 15 defective screws.

(5 + 5 = 10 marks)

Turn over

Module V

A   I.   A diet conscious housewife wishes to ensure certain minimum intake of Vitamins A, B, C for the family. The minimum daily needs of the Vitamins A, B, C for the family are respectively 30, 20 and 16 units. For the supply of these minimum Vitamin requirements the housewife relies on two fresh foods. The first one provides 7, 5, 2 units of the three Vitamins per gram respectively and the second one provides 2, 4, 8 units of the same Vitamins per gram of the food stuff respectively. The first food stuff costs Rs. 3.00 per gram and the second Rs. 2.00 per gram. Formulate linear programming model for the problem.

(10 marks)

   II.   Solve graphically :

Maximize $Z = 60x_1 + 30x_2$
subject to $\quad x_1 + x_2 \leq 4$
$\quad\quad\quad x_1 + x_2 \geq 2$
$\quad\quad\quad 5x_1 + 3x_2 \leq 15$
$\quad\quad\quad x_1, x_2 \geq 0.$

(10 marks)

Or

B   Solve using simplex method :

Maximize $Z = 5x_1 + 7x_2$
subject to $\quad 2x_1 + x_2 \leq 6$
$\quad\quad\quad 3x_1 + 4x_2 \leq 12$
$\quad\quad\quad x_1, x_2 \geq 0.$

(20 marks)

[5 × 20 = 100 marks]