B.Arch-I&II(S)-04-22-2000 Reg. No. | | | | | | | | | |

A

B.Arch. Degree I & II Semester Supplementary Examination April 2022

AR 1101 ARCHITECTURAL DESIGN I

(2014 Scheme)

Time: 4 Hours Maximum Marks: 100

Instructions:

(i) Drawing should be drafted in A1 white sheet.

(ii) The drawing should be properly dimensioned, labelled in good lettering and rendered appropriately.

(iii) Importance will be given to drafting quality, correctness of drawing and conformity with drafting standards.

(1 × 100 = 100)

I. Prepare a neatly drafted, detailed technical drawing for the building plan given below:

(a) Floor plan with plastering and door/window frames showing furniture layout in scale 1:50.

(b) South side elevation in scale 1:50.

(c) Section through the section line A-A in scale 1:50.

Design Data:

(i) Height of the plinth from the ground level is 0.45 m.

(ii) Lintel height is 2.1 m from floor.

(iii) Floor to floor height of the building is 3.0 m.

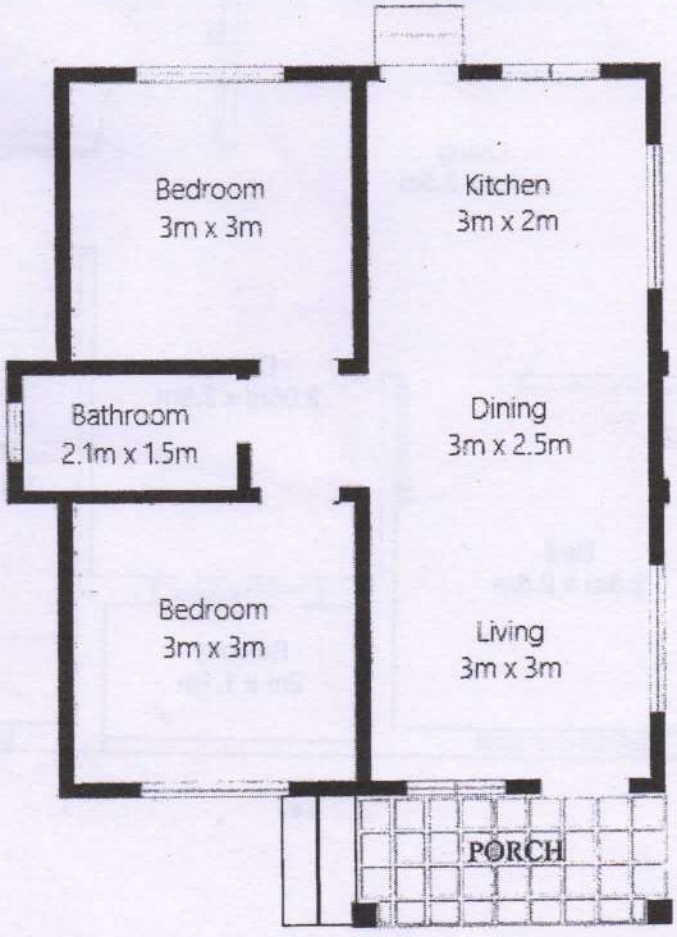
(iv) Size of the doors and windows may be assumed.

(v) Full wall thickness 0.23 m and half wall thickness 0.12 m.

(vi) Projected sunshades at lintel level.

(vii) Assume any other data if required.

(viii) Dimension the drawing in cm as per standards.



OR

(P.T.O.)

B.Arch-I&II(S)-04-22-2000

II. Prepare a neatly drafted, detailed technical drawing for the building plan given below:

(a) Floor plan with plastering and door/window frames showing furniture layout in scale 1:50.

(b) North side elevation in scale 1:50.

(c) Section through the section line A-A in scale 1:50.

Design Data:

(i) Height of the plinth from the ground level is 0.45 m.

(ii) Lintel height is 2.1 m from floor.

(iii) Floor to floor height of the building is 3.0 m.

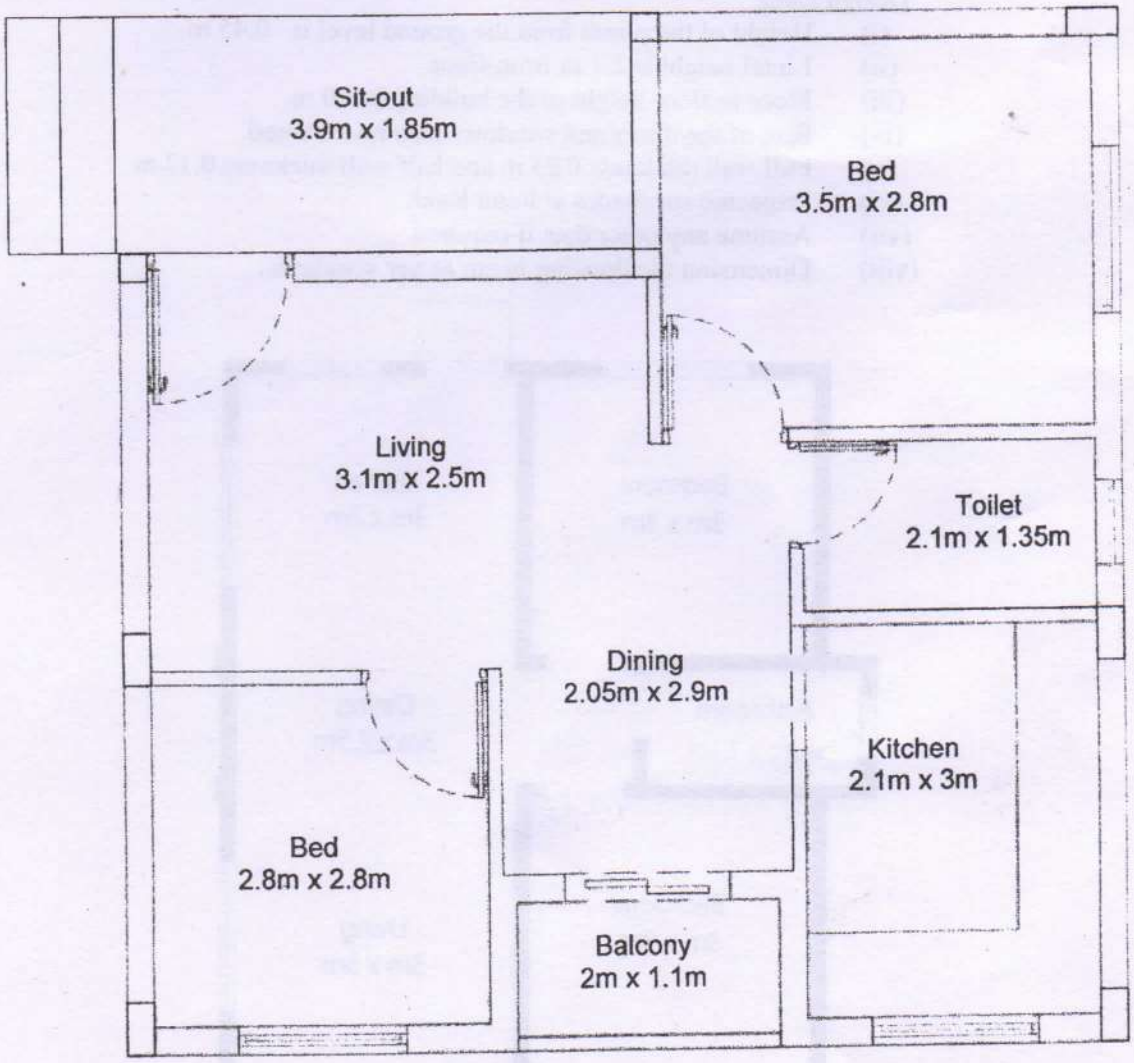
(iv) Size of the doors and windows may be assumed.

(v) Full wall thickness 0.23 m and half wall thickness 0.12 m.

(vi) Projected sunshades at lintel level.

(vii) Assume any other data if required.

(viii) Dimension the drawing in cm as per standards.



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B.Arch-I&II(S)-04-22-2001 Reg. No. | | | | | | | | |

B

B.Arch. Degree I & II Semester Supplementary Examination April 2022

AR 1102 BUILDING MATERIALS AND CONSTRUCTION I

(*2014 Scheme*)

Time: 4 Hours Maximum Marks: 100

PART A

(Answer *ALL* questions)

(8 × 5 = 40)

I. Write short notes on:

(a) Important properties of Mortar.

(b) Differentiate between Stretcher and Header.

(c) Compare Brickwork and Stonework

(d) Plugged joint in stone masonry

(e) Briefly explain Segmental Arch

(f) Rat-Trap bond

(g) What is meant by seasoning of Timber?

(h) Properties of bamboo.

(2 × 10 = 20)

II. What are the ingredients of mortar? Write the suitable proportions of mortar used for different types of construction.

OR

III. How is stone masonry classified? Describe stone masonry with neat sketches.

IV. Enumerate the various defects in Timber. How are they classified? What are the forces responsible for causing natural defects in timber?

OR

V. Explain, with neat sketches, the various types of Lengthening and Widening joints.

PART B

(2 × 20 = 40)

VI. Draw to a suitable scale the plan of alternate courses and elevation of brick walls meeting at corner with thickness of wall as 1½ bricks in single flemish bond.

OR

VII. Draw to a suitable scale the section and elevation of a three centered brick arch constructed of 20 cm thickness. Indicate the important parts of the arch.

VIII. Draw to a suitable scale, plan, section and elevation of a wooden framed paneled door to fit an opening of size 90 cm × 210 cm. Name the parts and indicate the size of each member.

OR

IX. Draw to scale the following joints in timber:

(i) Tongued and Grooved Joint

(ii) Mortise and Tenon joint

(iii) Halved joint

(iv) Notched joint

(v) Cogged joint.

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B.Arch-I&II(S)-04-22-2002 Reg. No. | | | | | | | | |

C

B.Arch. Degree I & II Semester Supplementary Examination April 2022

AR 1103 HISTORY OF ARCHITECTURE – I

(*2014 Scheme*)

Time: 3 Hours Maximum Marks: 100

(*Illustrate your answer with sketches wherever necessary*)

PART A

(Answer ***ALL*** questions)

(8 × 5 = 40)

I. Write short notes of the following.

(a) Jericho.

(b) Great Pyramid of Giza.

(c) Pantheon, Rome.

(d) Great Bath.

(e) Rathas in Mamallapuram.

(f) Chaitya at Karli and Viharas at Ajanta.

(g) Padmanabhapuram Palace.

(h) St. Mary's Church at Kallooppara.

PART B

(4 × 15 = 60)

II. Illustrate with sketches, the architectural features of Gobekli Tepe.

OR

III. Describe with sketches the Early Harappan settlements.

IV. "Egypt is the gift of Nile". Discuss the evolution of Egyptian civilization and its manifestations in the built form.

OR

V. Describe the importance of Parthenon in Ancient Greek Civilisation.

VI. Explain the different types of structures developed under Buddhist Architecture, taking any Buddhist cave dwelling unit as example.

OR

VII. Elaborate with neat sketches, the Architecture of Sanchi Stupa.

VIII. Discuss in detail with sketches.

(i) The Miskal Mosque at Kozhikode.

(ii) Climatic factors that influences the form of Kerala Architecture.

OR

IX. Explain the typical features of a temple in Kerala with reference to Vadakkumnathan temple in Thrissur. Also enumerate the terminologies associated with typical Pancha Prakara temple at Kerala.

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B.Arch-I&II(S)-04-22-2006 Reg. No. | | | | | | | | |

C

B.Arch. Degree I & II Semester Supplementary Examination April 2022

AR 1105 ARCHITECTURAL GRAPHICS I

(*2014 Scheme*)

Time: 4 Hours Maximum Marks: 100

(*Candidates will be supplied with one A2 handmade drawing sheet*)

(All questions carry ***EQUAL*** marks)

(4 × 25 = 100)

I. What were the contributions of Renaissance to art and Architecture?

OR

II. Make a still life composition with flower vase and fruit basket arranged on a table. Use any color medium. Qualities such as light and shade, balance and harmony etc. should be maintained.

III. Describe in detail the Elements and principles of design with suitable drawings.

OR

IV. Write an essay on the contribution of Raja Ravi Varma in the field of Indian art.

V. Design a multi colour poster A3 (11 ×16 inch) for the campaign "Importance of Exercise".

OR

VI. Draw the interior space of theatre for performing art with performers. Details of lighting, furniture and spectators should be shown.

VII. Make a one point perspective composition of a landscape with trees, plants, animals etc. render in pencil with light and shade effect.

OR

VIII. Draw the bird's eye view of a Children's Park showing humans, playground equipment's, amenities and colour rendering of the same.

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B.Arch-I&II(S)-04-22-2004 Reg. No. | | | | | | | | | A

B.Arch. Degree I & II Semester Supplementary Examination April 2022

AR 1106 MATHEMATICS
(2014 Scheme)

Time: 3 Hours Maximum Marks: 100

PART A
(Answer *ALL* questions)

(8 × 5 = 40)

I. (a) Solve the exact equation $(y\cos x+1)dx+\sin x\,dy=0$.

(b) Solve the equation $\left(D^2+4\right)y=e^x+\sin(2x)$.

(c) If $u=\sin^{-1}\left(\dfrac{x^2+y^2}{x-y}\right)$, $x\neq y$; prove that $x\dfrac{\partial u}{\partial x}+y\dfrac{\partial u}{\partial y}=\tan(u)$.

(d) Prove that $J\times J^*=1$, where $u=\sqrt{xy}$, $v=\sqrt{\dfrac{x}{y}}$.

(e) Find the value k for which $f(x)=\begin{cases}\dfrac{1}{k};\ a\le x\le b\\ 0;\ \text{otherwise}\end{cases}$ is a pdf. Find k and $E(X)$.

(f) Find mean and the variance of uniform distribution.

(g) A sample of 100 items gave a mean 7.4 kg and SD 1.2 kg. Find 95% confidence limit for the population mean.

(h) Define the following terms:
(i) Type I error (ii) Confidence Interval (iii) Testing the Hypothesis.

PART B

(4 × 15 = 60)

II. (a) Solve $\dfrac{dx}{dt}+2y=\sin(2t)$, $\dfrac{dy}{dt}-2x=\cos(2t)$. (8)

(b) Solve $x^2\dfrac{d^2y}{dx^2}-x\dfrac{dy}{dx}+y=\log x$. (7)

OR

III. (a) Solve the differential equation $2\dfrac{dy}{dx}=\dfrac{y}{x}+\dfrac{y^2}{x^2}$ reducing to Bernoulli's equation. (8)

(b) Solve $\dfrac{d^2y}{dx^2}+\dfrac{dy}{dx}=x^2+2x+4$. (7)

(P.T.O.)

IV. (a) If u is a homogeneous function of degree n in x and y. Show that (7)

$$x^2\frac{\partial^2 u}{\partial x^2}+2xy\frac{\partial^2 u}{\partial x\partial y}+y^2\frac{\partial^2 u}{\partial y^2}=n(n-1)u.$$

(b) Examine the function $u=x^3y^2(12-x-y)$ for maxima and minima. (8)

OR

V. (a) The dimension of a cone radius 5 cm and height 8 cm. What is the error in the calculated volume if the scale used in taking the measurement is short by 0.01 cm/cm. (9)

(b) If $u=\sin^{-1}\left(\frac{x}{y}\right)+\tan^{-1}\left(\frac{y}{x}\right)$ prove that $\left(x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}\right)=0.$ (6)

VI. (a) From the following data obtain the two Regression equations (7)

x	6	2	10	4	8
y	9	11	5	8	7

(b) In sampling a large number of parts manufactured by a machine the mean number of defect is in a sample of 20 is 2. Out of 1000 such samples how many would be expected to contain (8)

(i) No defective

(ii) Exactly three defective

(iii) Not more than three defective

(iv) At least three defective

OR

VII. (a) Use the method of least squares to determine a and b in the formula $y=ax+bx^2$ for the following data. (8)

x	1	2	3	4	5
y	1.8	5.1	8.9	14.1	19.8

(b) Fit a Poisson distribution to the following data (7)

x:	0	1	2	3	4
y:	122	60	15	2	1

VIII. (a) A machine is expected to produce nails of lengths 2 cm. A random sample of 25 nails gave an average length 2.1 cm and SD 0.25 cm. Can it be said that the machine is producing nails as per specifications. (8)

(b) The height of 6 randomly chosen sailors are in inches 63, 65, 58, 69, 71 and 72. The heights of 10 randomly chosen soldiers are in inches 61, 62, 65, 66, 69, 69, 70, 71, 72 and 73. Do these figures indicates that soldiers are on an average shorter than sailors? Test at 5% level of significance. (7)

OR

IX. (a) An educator claims that an average IQ of an American college students almost 110 and that in a study made test his claim, 150 American college students had an average IQ of 11.2 with SD 7.2. At 1% level of significance tests the claim of the educator. (8)

(b) The wholesaler in bulbs supplied by him is defective. A random sample of 600 bulbs contained 36 defectives. Test the claim of the whole seller. (7)

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B.Arch-I&II(S)-04.22-2005 Reg. No. | | | | | | | | | |

B

B.Arch. Degree I & II Semester Supplementary Examination April 2022

AR 1107 GEOMETRICAL DRAWING

(2014 Scheme)

Time: 4 Hours Maximum Marks: 100

Instructions: *(i) Questions in Part A should be answered in the answer book provided to the candidate.*

(ii) Questions in Part B should be answered in the drawing sheet provided.

PART A

(Answer *ALL* questions)

(8 × 5 = 40)

I. Write short notes on:

(a) Define a parabola. Draw a parabola and mark the following:
- (i) Directrix
- (ii) Tangent
- (iii) Focal chord
- (iv) Latus rectum
- (v) Vertex.

(b) Differentiate between Archimedean spiral and Logarithmic spiral.

(c) Draw the orthographic projections of point B located 32 mm behind V.P. and 92 mm below H.P.

(d) Define 'trace of a line'. Also give the method to locate horizontal trace and vertical trace of a line.

(e) What are the different methods of development of surfaces?

(f) What do you mean by 'sectional view' and 'true shape of section?

(g) Explain the construction of the Isometric scale.

(h) Define the following terms:
- (i) Visual rays
- (ii) Picture plane
- (iii) Ground line
- (iv) Horizon line
- (v) Vanishing point.

PART B

(4 × 15 = 60)

II. The foci of an ellipse are 80 mm apart and minor axis is 60 mm long. Determine the length of the major axis. Complete the ellipse by the concentric circles method.

OR

III. Draw an archimedian spiral of one and half convolutions when the greatest and shortest radii are 70 mm and 16 mm respectively.

IV. The elevation of a line is 50 mm long and 55 degrees inclined to x-y line. The line is inclined to VP at 30 degree Draw the projections of the line and find its true length and true inclination with H.P. One end is nearer to HP than the other end which is nearer to VP.

OR

(P.T.O.)

V. A square pyramid of base edge 35 mm and altitude 50 mm has one of its slant faces in the VP and the edge of the base contained by that face is inclined at 45 degree to the H.P. Draw the projections of the pyramid when the vertex is in the HP.

VI. A cone base diameter 120 mm and height of 135 mm is resting on HP on its base. It is cut by a section plane inclined at 45 degrees to the HP and passing through a point on the axis and is 65 mm below the vertex of cone. Draw the front view, sectional top view and true shape of section.

OR

VII. Draw the development of the lateral surface of a right regular hexagonal pyramid of side 40 mm and height 100 mm. It stands in its base of HP with one of its edges parallel to VP. A circular hole of diameter 40 mm is drilled through the pyramid in such a way that the arch of the hole is perpendicular to VP and 30 mm above the base. Assume that the axes intersect each other.

VIII. A square pyramid of side of base 40 mm and height 60 mm is resting on its base upon HP, keeping the base edges equally inclined to VP. The pyramid is cut by a section plane, 30 degrees inclined to HP and passing through the midpoint of the axis. Draw the isometric view of pyramid showing the section.

OR

IX. A square pyramid of 25 mm base edge and 50 mm axis rests on the ground with its base edges equally inclined to PP. The station point is 50 mm above the ground. 45 mm in front of PP and 10 mm to the left of nearest corner. Draw the perspective projections of the solid.

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B.Arch-I&II(S)-04.22-2003 Reg. No. | | | | | | | | |

A

B.Arch. Degree I & II Semester Supplementary Examination April 2022

AR 1108 MECHANICS OF STRUCTURES

(*2014 Scheme*)

Time: 3 Hours Maximum Marks: 100

PART A

(Answer ***ALL*** questions)

(8 × 5 = 40)

I. (a) Explain Parallelogram law of forces with equations.

(b) Define static and dynamic friction with examples.

(c) Derive moment of inertia of a rectangular section about its centroidal axes.

(d) What are the assumptions used in the analysis of trusses?

(e) Draw the shear force and bending moment diagrams of a cantilever beam of length ℓ m carrying a uniformly distributed load over its entire length.

(f) Define Point of Zero shear and Point of Contra flexure with examples.

(g) Explain Bulk modulus, Young's modulus and Modulus of rigidity. Explain the relation between them.

(h) Write down the assumptions used in theory of simple bending.

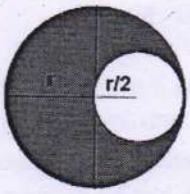
PART B

(4 × 15 = 60)

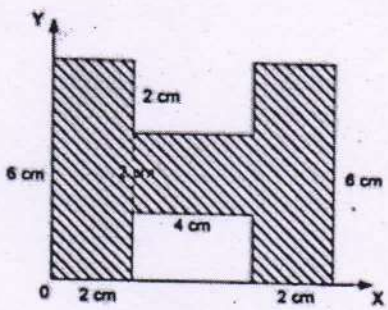
II. Two men carry a weight of 8 kN by means of two ropes fixed to the weight. One rope is inclined at 45^0 and the other at 30^0 with their vertices. Find the tension in each rope.

OR

III. Locate the centroid of the area shown in the figure.



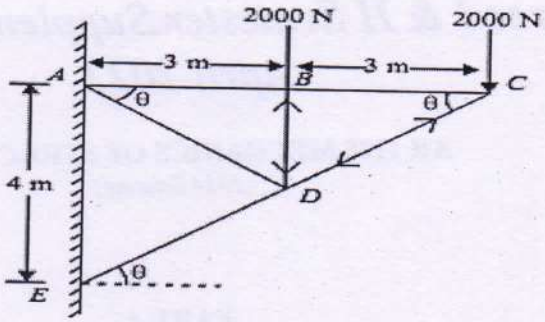
IV. Determine the moment of inertia for the section with respect to X and Y axes.



OR

(P.T.O.)

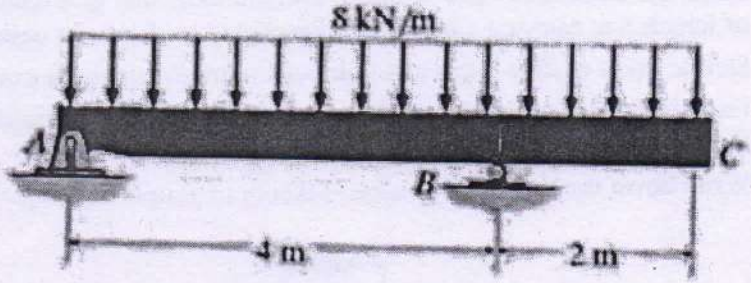
V. Find the axial forces in all members of the following truss.



VI. A simply supported beam AB of 5m span carries a uniformly distributed load of 3 kN/m over the entire span with a point load of 10 kN at 2.5 m from the left hand support. Draw the shear force and bending moment diagrams for the above mentioned beam.

OR

VII. Draw the shear force and bending moment diagrams for the given overhanging beam.



VIII. A steel rod of 30 mm diameter is enclosed centrally in a hollow aluminum tube of internal diameter 40 mm and thickness of 10 mm. The composite member is then subjected to an axial pull of 60000 N. If the length of each (rod and tube) is equal to 500 mm, determine:

(i) the stress in the rod and tube.

(ii) load carried by the rod and tube. Take $E_{Steel} = 2.1 \times 10^5$ N/mm^2 and $E_{Al} = 0.7 \times 10^5$ N/mm^2.

OR

IX. A Cantilever beam of span 2 m has a hollow square cross section with outer and inner dimensions 50 mm and 40 mm support a point load of intensity W kN at free end. If the safe bending stress is 35 N/mm^2, calculate the safe intensity of the load which can be supported by the beam.

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B.Arch-I&II-(S)-04-22-2007 Reg. No. | | | | | | | | |

A

B.Arch. Degree I & II Semester Supplementary Examination April 2022

AR 1109 SURVEYING AND LEVELLING

(*2014 Scheme*)

Time: 3 Hours Maximum Marks: 100

PART A

(Answer *ALL* questions)

(8 × 5 = 40)

I. (a) Write short note on (i) field book (ii) Offset.

(b) Explain Radiation Method in plane table survey.

(c) How vertical angle is measured by using theodolite?

(d) Explain the method for balancing the closing error.

(e) How map is prepared using Aerial Survey?

(f) Write down the uses and applications of GPS.

(g) Explain Line of collimation, Reduced level and Benchmark in levelling.

(h) What do you understand by Profile levelling? Explain with neat sketch.

PART B

(4 × 15 = 60)

II. Explain the relevance of Land Topography in Architecture.

OR

III. Write the procedure to find out the position of station using Mechanical method for Three point problem with neat figure.

IV. What are the temporary and permanent (any two) adjustments of a theodolite?

OR

V. Explain the procedure of Ordinary method, Repetition method and Reiteration method for the measurement of the horizontal angle using a theodolite.

VI. Write in detail about Distomat, Auto Level and Digital Level.

OR

VII. Write in detail the working principle of Total Station. What are the advantages of total station over other surveying instruments?

VIII. What do you understand by Contour Interval? What are the factors affecting Contour Interval? Also write note on characteristics of contour map.

OR

IX. The following staff readings were observed successively with a level, the instrument having been moved after third, sixth and eighth readings 2.228, 1.606, 0.988, 2.090, 2.864, 1.262, 0.602, 1.982, 1.044, 2.684 meters. Enter the above readings in a page of a level book and evaluate the R.L. of points, if the first reading was taken with a staff held on a bench mark of 432.384 m.

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