B.Arch-I(R/S)-11.22-2136 Reg. No. | | | | | | | | |

C

B.Arch. Degree I Semester Regular/Supplementary Examination November 2022

AR 1102 BUILDING MATERIALS AND CONSTRUCTION I

(*2021 Scheme*)

Time: 4 Hours Maximum Marks: 100

PART A

(Answer ***ALL*** questions)

(8 × 5 = 40)

I. Write short notes on:

(a) Classification of forces.

(b) Relevance of Building materials and construction in Architecture.

(c) Aggregate.

(d) Artificial stones.

(e) Pile foundation.

(f) Distinguish between load bearing and framed structure.

(g) Garden wall bond.

(h) Flemish bond.

PART B

(4 × 10 = 40)

II. Elaborate on the support and supported elements of a building.

OR

III. Discuss the different types of loads and the concept of span.

IV. Explain the classification of natural stones and discuss the application of any two natural stones.

OR

V. Discuss any one method of manufacturing glass and explain the types of safety glass and its properties.

VI. Discuss the vertical and horizontal structural subsystem.

OR

VII. Explain the different types of shallow foundation with sketches.

VIII. Explain the manufacturing process of clay bricks.

OR

IX. Discuss why brick masonry is preferred over other masonry and the rules for brick bonding.

PART C

(1 × 20 = 20)

X. Draw to a suitable scale the plan of alternate courses and elevation of a 1 brick thick L- shaped Rat-trap bond.

OR

XI. Draw to a suitable scale the plan of alternate courses and elevation of a 1 and 1/2 brick thick L-shaped English bond.

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B

B.Arch. Degree I Semester Regular/Supplementary Examination November 2022

AR 1103 HISTORY OF ARCHITECTURE I - ANCIENT CIVILIZATIONS

(*2021 Scheme*)

Time: 3 Hours Maximum Marks: 100

(*Illustrate your answers with sketches wherever necessary*)

PART A

(Answer **ALL** questions)

(8 × 5 = 40)

I. Write short notes on the following:

(a) Catal Huyuk

(b) Gobekli Tepe.

(c) Staircases of Persepolis

(d) Ziggurat

(e) Characteristics of Egyptian Architecture

(f) Obelisks

(g) The Great bath

(h) Lower town of Mohenjo-Daro

PART B

(4 × 15 = 60)

II. Discuss in detail with suitable examples:

(i) Passage graves

(ii) Gallery graves

OR

III. Elaborate on the evolution of shelters throughout the prehistoric eras.

IV. Explain in detail about the planning of palaces at Assyria. Elaborate using relevant examples.

OR

V. Describe in detail about the physical planning of the city of Babylon.

VI. Explain in detail:

(i) Mastaba

(ii) Pyramid of Giza

OR

VII. Explain in detail about the history, evolution and architectural characteristics of Nile Valley Civilization. Elaborate using relevant examples.

VIII. Illustrate about the city planning and architectural characteristics of Indus Valley Civilization with relevant examples.

OR

IX. Explain in detail about the Shelters typologies, civic buildings and drainage systems of Indus Valley Civilization.

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B

B.Arch. Degree I Semester Regular/Supplementary Examination November 2022

AR 1104 ARCHITECTURAL GRAPHICS AND DRAWING - I

(*2021 Scheme*)

Time: 4 Hours Maximum Marks: 100

(*Candidates will be supplied with one A-2 handmade drawing sheet*)

(All Questions carry ***EQUAL*** marks)

(4 × 25 = 100)

I. Explain in detail the importance of tone and texture in art.

OR

II. Create an interesting composition with basic geometric shapes in a 3D form, essential light and shade can be added. (any color medium can be used).

III. A large basket of fruits contains 3 oranges 2 apples, 2 bananas. Draw an interesting still life composition with suitable light and shadow effect. (The light source coming from left hand side).

OR

IV. Explain the importance of Line and Shape in visual art.

V. Draw a site plan of a residential building, including site elements such as trees, plants, bushes, lawn, pool, pavement, people, roof details and other relevant elements. Use different rendering techniques to depict textures, light and shadow and element characteristics, use any color medium.

OR

VI. What are the principles of design essential for a great composition? Explain it with illustrative sketches.

VII. Draw a top view of interior space showing floor, human, curtains furniture and other applicable elements, using any medium.

OR

VIII. Make an interesting three dimensional stable composition using three bottles, two balls and one lampshade in the space provided. Also show the effect of light and shadow on the composition.

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A

B.Arch. Degree I Semester Regular/Supplementary Examination November 2022

AR 1105 GEOMETRICAL DRAWING

(*2021 Scheme*)

Time: 4 Hours Maximum Marks: 100

PART A

(Answer *ALL* questions)

(8 × 5 = 40)

I. Write short notes of the following:

(a) Perspective projections.

(b) Differentiate between Archimedean spiral and Logarithmic spiral.

(c) Explain sectional view and true shape of section.

(d) Explain locating the center of an Arc.

(e) Isometric and Oblique projection.

(f) Define:

(i) Station point

(ii) Picture plane

(iii) Vanishing point.

(g) Shadows of architectural elements.

(h) Application of sciography in architecture.

PART B

(4 × 15 = 60)

II. In a logarithmic spiral, the shortest radius is 40 mm and the length of adjacent radius vectors enclosing 30 degree are in the ratio 9:8. Construct the spiral for 1 convolution.

OR

III. The major axis of an ellipse is 150 mm long and the minor axis is 100 mm long. Find the foci and draw the ellipse by 'arcs of circles' method. Draw a tangent to the ellipse at a point on it 25 mm above the major axis.

IV. A pentagonal prism, base 25 mm side and axis 50 mm long, resting on one of its rectangular faces on the HP, with the axis inclined at 45 degree to the VP. Draw its projections.

OR

V. A hexagonal pyramid, base 30 mm side and axis 65 mm long, is resting on its base on the H.P, with two edges parallel to the V.P. It is cut by a section plane, perpendicular to the VP inclined at 45 degree to the HP and intersecting the axis at a point 25 mm above the base. Draw the front view, sectional side view and true shape of the section.

VI. Draw the isometric view of 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 degree to the HP.

OR

(P.T.O.)

VII. A square prism of base 30 mm and height 50 mm rest on the Ground Plane (GP) with edges equally inclined to the picture plane (PP). The corner nearest to PP is 30 mm to the right of the station point and 20 mm behind the PP. The station point is 65 mm above GP and 80 mm in front of PP. Draw the perspective view of the square prism.

VIII. Draw Sciography for the following conditions:

(i) Square plane 50 mm side perpendicular to both the planes, 20 mm above HP and 40 mm away from VP.

(ii) Isosceles triangle of sides 60 mm and 50 mm, 50 mm respectively, is placed 60 mm above HP and perpendicular to HP and 40 mm away from VP parallel to VP.

(iii) Circular plane of diameter 50 mm perpendicular to VP parallel to HP, 40 mm above HP and 20 mm away from VP.

OR

IX. Draw a sectional perspective of a room of size 3 m × 3 m × 3 m. Add furniture such as a sofa set, table, fan, wall hangers, etc. Apply principles of sciography to render the image.

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B.Arch. Degree I Semester Regular/Supplementary Examination November 2022

AR 1106 MATHEMATICS

(*2021 Scheme*)

Time: 3 Hours Maximum Marks: 100

PART A

(Answer *ALL* questions)

(8 × 5 = 40)

I. (a) Reduce to Echelon form $\begin{bmatrix} 3 & 1 & 2 \\ 2 & -3 & -1 \\ 1 & 2 & 1 \end{bmatrix}$.

(b) Find the rank of the matrix $\begin{bmatrix} 1 & 4 & 5 \\ 2 & 6 & 8 \\ 3 & 7 & 22 \end{bmatrix}$.

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

(d) Find the particular integral of $\left(D^3+1\right)y=\sin\left(2x+3\right)$.

(e) Check the given function for which $f(x)=\begin{cases}\frac{3}{4}x(2-x)\,;0\le x\le 1\\ 0\,;\text{ Other wise}\end{cases}$ is a pdf or not and find $P(2\le x\le 4)$.

(f) Three unbiased coins are tossed. Find the expectation of number of heads.

(g) The probability that a pen manufactured by a company will be defective is $\frac{1}{10}$. If 12 such pens are manufactured, find the probability that at least two will be defective and none will be defective.

(h) If the probability of a bad reaction from a certain injection is 0.001, determine the chance that out of 2000 individuals more than two will get a bad reaction.

PART B

(4 × 15 = 60)

II. (a) Find the inverse of the matrix $\begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$ using elementary transformation. (7)

(b) Solve the following system of equations by Gauss elimination method. (8)
$x+y+z=8,\ x-y+2z=6,\ 3x+5y-7z=14$.

OR

(P.T.O.)

III. (a) Use Gauss-Jordan method to find the inverse of the matrix $\begin{bmatrix} 1 & -1 & 1 \\ 4 & 1 & 0 \\ 8 & 1 & 1 \end{bmatrix}$. (7)

(b) Solve the following system of equations by matrix method. (8)
$x+y+z=3,\quad x+2y+3z=4,\quad x+4y+9z=6$.

IV. (a) Solve $y\left(2xy+e^{x}\right)dx=e^{x}dy$. (7)

(b) Solve the differential equation $\frac{dy}{dx}+y\tan x=y^{3}\sec x$ reducing to Bernoulli's equation. (8)

OR

V. (a) Solve $\frac{d^{2}y}{dx^{2}}-4y=x\sin hx$. (7)

(b) Solve $\frac{d^{2}y}{dx^{2}}+4y=e^{x}+\sin 2x$. (8)

VI. (a) A random variable has the pdf $f(x)=\begin{cases} 2e^{-2x}; x>0 \\ 0 \quad ; x\le 0 \end{cases}$. Find mean and standard deviation. (7)

(b) A random variable X has the following probability function: (8)

Values of x	:	-2	-1	0	1	2	3
$p(x)$	:	0.1	k	0.2	$2k$	0.3	k

Find the value of k and calculate mean and variance.

OR

VII. (a) If $f(x)=\begin{cases} \frac{1}{2}(x+1); -1<x<1 \\ 0\ ; \quad \text{elsewhere} \end{cases}$, represent the density of a random variable X. Find $E(X)$ and $E\left(2X+6X^{2}\right)$. (8)

(b) Four coins are tossed what is the expectation of the number of heads? (7)

VIII. (a) The following data are the number of seeds generating out of 10 on damp filter paper for 80 sets of seeds. Fit a Binomial distribution to the following data: (8)

x:	0	1	2	3	4	5	6	7	8	9	10
f:	6	20	28	12	8	6	0	0	0	0	0

(b) By the method of least squares, find the straight line that best fits the following data: (7)

x:	1	2	3	4	5
y:	14	27	40	55	68

OR

IX. (a) Fit a Poisson distribution to the following data: (7)

x:	0	1	2	3	4
y:	46	38	22	9	1

(b) Find the correlation coefficient and the regression lines of x on y and y on x for the following data: (8)

x:	1	2	3	4	5
y:	2	5	3	8	7

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