SECTION A

There are SEVEN questions in this section. Answer Q. No. 1 and any FOUR from the rest.

1. Write short notes on:
   (a) Romanesque vaulting system
   (b) Gothic Flying Buttress
   (c) Humanism in Renaissance Period.
   \[3 \times 10 = 30\]

2. Development of domes to cover square or polygonal centralized plan is the main feature of Byzantine Architecture. Explain the Architectural characteristics of Byzantine Architecture in the light of this statement.
   \[10\]

3. 'The stability of Gothic Church depends on the proper adjustment of thrust and counter thrust' — explain the structural innovations of Gothic Period with reference to the above statement (use sketch where necessary).
   \[10\]

4. Show the chronological development of Western architectural styles starting from Early Christian period.
   \[10\]

5. State the architectural characteristics of Early Renaissance Period with proper sketch and examples.
   \[10\]

6. Describe the internal space of a Romanesque Church with relevant sketches.
   \[10\]

7. Explain the main theme of 'Purist' and 'Mannerist' thoughts in high Renaissance architecture.
   \[10\]

Contd ........... P/2
There are **SEVEN** questions in this section. Answer Q. No. 8 and any **FOUR** from the rest.

8. Write short notes on:
   (a) Roman Basilica
   (b) Roman Thermae
   (c) Greek Acropolis

   \(3 \times 10 = 30\)

9. Discuss the optical corrections made by the Greek with reference to the 'Parthenon' temple.

   \(10\)

10. Discuss the geographical, geological, climatic and religious influences upon the Architectural characteristics of Greek temples. Explain your thoughts with examples and sketches.

    \(10\)

11. Show the different types of temples in Greek Architecture with sketches.

    \(10\)

12. Illustrate the characteristics of Roman Architecture with sketches.

    \(10\)

13. Narrate different types of 'Greek Order' with proper sketches.

    \(10\)

14. Describe the Roman circular temple 'Pantheon' with necessary sketches.

    \(10\)
SECTION – A
There are FOUR questions in this section. Answer any THREE.

1. Assess the unique qualities of daylight in detail. (23 1/3)

2. Justify the importance and application of daylight simulation for sustainable building design. (23 1/3)

3. Differentiate design strategies of buildings for daylighting in hot-dry climate and those in warm-humid climate. (23 1/3)

4. Appraise with annotated sketches the daylighting features of an internationally renowned architectural project. (23 1/3)

SECTION – B
There are FOUR questions in this section. Answer any THREE.

5. Critically explain the four photometric terms: flux, intensity, illumination and luminance along with their conceptual relationship. (23 1/3)

6. Assess the measurement techniques of different visual efficiency for human eye, i.e. visual acuity, contrast sensitivity and visual performance. Correlate visual efficiency with the level of illumination. (23 1/3)

7. Illustrate visual field and its component parts. Explain in detail the external vision factors and the relationships between them. (23 1/3)

8. Evaluate the salient features that needs to be considered for lighting design inside interior space. Interpret the benefits, characteristics and design process of supplementary artificial lighting. (23 1/3)
SECTION A

There are FOUR questions in this section. Answer any THREE.

1. (a) Define Rigid Body. Briefly discuss the classification of force systems with examples. (2+8=10)

(b) In figure 1, the bodies A and B, connected by a cord and resting on smooth planes, weigh \( W_A = 70 \text{ lb.} \) and \( W_B = 60 \text{ lb.} \). Determine the angle \( \theta \) and tension in the cord. (13\frac{1}{2})

![Figure-1](image)

2. (a) A 4000 lb wheel with a radius of 3 ft is acted upon by a force "F" (Figure-2), which tends to pull the wheel over the obstruction at A. At the instant the wheel is about to move, the pressure between the wheel and the ground is zero. What is the magnitude of the force F at this instant? (8)

![Figure-2](image)
(b) Find by integration the 'Y' coordinate of center of gravity of the plane triangle shown in Figure-3.

(c) Find moment of inertia of the triangle (Figure-3) about its base by direct integration.

(d) State Parallel Axis Theorem. Using the result found in question 2(b), find moment of inertia of the same triangle about a line passing through its centroid parallel to base using transfer formula.

3. (a) Develop an equation showing "Shape of Uniformly loaded cable". Derive equations for maximum tension and the slope of the cable at the supports.

(b) What do you mean by "Catenary"?

(c) A cable is suspended with its ends at the same elevation and 600 ft apart. The load is uniformly distributed horizontally. When the sag is 7% of the span, the maximum tension is 3000 lb. What is the load in pounds per foot?

4. (a) Define shear force and bending moment with brief discussion on their sign convention.

(b) Find the reactions of the beam shown in Figure-4 and draw its free body diagram.

(c) Draw shear force diagram of the beam (Figure-4).
There are FOUR questions in this section. Answer any THREE.

5. (a) Write down the assumptions of an ideal truss. (3\%)
(b) For the truss shown in Figure-5, find the forces in the members 'be', 'cf', 'df', 'ij' and 'ik'. (20)

6. (a) Determine the x and y coordinates of the centroid of the area shown in Figure-6. (13\%)
(b) For the beam shown in Figure-7, calculate the reactions at the supports. (10)

7. (a) For the beam shown in Figure-8, draw shear force and bending moment diagrams. (13\%)
(b) Determine the moment of inertias of the angle section (L-section) shown in Figure-9 about its centroidal axes. (10)

8. (a) For the area enclosed by arcs of the parabolas \( y^2 = 9x \) and \( x^2 = 4y \) drawn in Figure-10, determine the location of the centroid, where the linear units are inches. (13\%)
(b) For the area bounded by the curve \( x^2 = 9y \), the straight line \( x = 4 \) inch and the x-axis given in Figure-11, calculate the moment of inertia of the area about the x-axis, using the direct integration method. (10)