**Q. 1 – Q 20 carry one mark each.**

1. Ramsar list is related to
   (A) Wetlands (B) Heritage buildings
   (C) Seismic zones (D) Special Economic Zones

2. Hazen's-William's nomogram is used to calculate
   (A) size of sanitary pipe lines (B) size of water supply pipe lines
   (C) capacity of overhead water reservoir (D) capacity of water required for fire fighting

3. A woonerf is a
   (A) pavement pattern (B) sanitation system element
   (C) speed reducing element (D) furniture details

4. In urban planning, cohort refers to
   (A) age and sex classification of population
   (B) contour levels in slope analysis
   (C) land use classification of public and semi-public spaces
   (D) soil layer classification

5. The project Habitat, Montreal, designed by Moshe Safdie is an example of
   (A) high rise apartments (B) low rise detached dwellings
   (C) organic architecture (D) prefabricated housing

6. The degree of freedom of a joint in a plane truss is
   (A) two (B) three (C) four (D) six

7. A brick cut lengthwise into two pieces so that each piece is half as wide as the full brick is called a
   (A) King closer (B) Frog (C) Quoin brick (D) Queen closer

8. The strength of concrete increases with
   (A) increase in water cement ratio (B) decrease in water cement ratio
   (C) increase of workability (D) decrease in cement aggregate ratio

9. The point of contraflexure is the point where the
   (A) shear force changes its sign (B) deflection is zero
   (C) bending moment changes its sign (D) torque is zero

10. When wind loads are accounted for in the design of structures, the permissible stresses in the material are increased by
    (A) 10% (B) 16.33% (C) 33.33% (D) 50%

11. The term coined by Paolo Soleri that combines ecology with architecture and deals with habitants maintaining an extremely high population density is
    (A) Archaeology (B) Proxemics (C) Arcology (D) Utopia

12. A dislocation of continuity in rock strata as a result of cracking of the earth's crust is called
    (A) Fissure (B) Fault (C) Eluvium (D) Drift

13. LEED is the internationally accepted rating system for
    (A) Green buildings (B) Fir resistant buildings
    (C) Intelligent buildings (D) Tall buildings

14. An architect of the Chicago School movement is
    (A) Richard Boyle (B) Louis Sullivan
    (C) Hector Guimard (D) William Morris

15. Surkhi is obtained by grinding
    (A) well burnt clay bricks (B) Slag from industry
    (C) stone aggregate (D) rice husk

16. Hemadpanthi style of temples belongs to
    (A) Himalaya (B) Deccan (C) Orissa (D) Kerala

17. A building in which the roof is perfectly hemispherical on the inside and a shallow dome on the outside is
    (A) Hagia Sopia (B) Pantheon (C) Parthenon (D) Gol Gumbaz

18. National Science Centre at Pragati maidan, New Delhi, is designed by
(A) J. A. Stein (B) Anant Raje (C) Raj Rewal (D) A. P. Kanvinde

19. In Islamic architecture, the device used for placing a perfect circular dome over a square plan is called a
(A) Mehrab (B) Scroll (C) Mastaba (D) Squinch

20. Parallel sound rays incident on a convex surface of a fibre-board will
(A) converage and reduce in intensity
(B) converage and increase in intensity
(C) disperse and reduce in intensity
(D) disperse and increase in intensity

**Q. 21 to Q. 75 carry two marks each.**

21. Match the architect-planners in Group I with their contributions in Group II

| Group I | | Group II | |
|---|---|---|---|
| P. | Hippodamus | 1. | City beautiful |
| Q. | Michelangelo | 2. | Star-shaped plan |
| R. | Leon battista Alberti | 3. | Grid iron plan |
| S. | Daniel Burnham | 4. | Campidoglio |
| | | 5. | St. Peter's Square |

(A) P – 3, Q – 4, R – 2, S – 1 (B) P – 3, Q – 5, R – 2, S – 4
(C) P – 4, Q – 1, R – 5, S – 3 (D) P – 3, Q – 2, R – 1, S – 5

22. The characteristics of Japanese gardens are

| | | | |
|---|---|---|---|
| P. | Stepping stones | S. | Miniature symbolic elements |
| Q. | Stone lanterns | T. | Stone water basins |
| R. | Octagonal geometry | U. | Monumental scale |

(A) P, Q, S, T (B) P, Q, U (C) R, S, T (D) Q, r, S, T

23. Match the styles of architecture in Group I with the elements in Group II

| Group I | | Group II | |
|---|---|---|---|
| P. | Khajuraho | 1. | Star-shaped Garbhagriha |
| Q. | Dravidian | 2. | Gopuram |
| R. | Hoyasala | 3. | Pyramidal Roof |
| S. | Himalaya | 4. | Urushringa |

(A) P – 1, Q – 2, R – 4, S – 3 (B) P – 4, Q – 2, R – 1, S – 3
(C) P – 2, Q – 4, R – 3, S – 1 (D) P – 3, Q – 4, R – 2, S – 1

24. A site has a uniform slope of 6%. The site map has seven contour lines with the elevation of the highest contour as +53 metres. If the distance between the midpoints of the highest and the lowest contours is 700 metres, then the contour interval in metres is
(A) 6 (B) 7 (C) 11 (D) 42

25. Match the statements about thermal comfort in Group I with True/False in Group II

| Group I | | Group II | |
|---|---|---|---|
| P. | Low capacitance materials should be used to store heat gain. | 1. | True |
| Q. | Stack effect depends on temperature difference between indoor and outdoor air | 2. | False |
| R. | Venturi effect is a passive cooling technique | | |
| S. | Wind breaks are used to maximize winter wind turbulence | | |

(A) P – 1, Q – 2, R – 2, S – 2 (B) P – 1, Q – 2, R – 2, S – 1
(C) P – 2, Q – 1, R – 1, S – 2 (D) P – 2, Q – 1, R – 1, S – 1

26. A person standing at a point in a public plaza is observing a façade of height 40 metres from a distance of 120 metres. The sense of enclosure experienced by the person is equivalent to the limits of
(A) Loss of enclosure (B) Minimal enclosure
(C) Full enclosure (D) Threshold of enclosure

27. Match the Urban Planning Theories in Group I with their proponents in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | Sector Theory | 1. | Water Christaller |
| Q. | Multiple Nuclei Theory | 2. | Clarence Perry |
| R. | Neighbourhood Theory | 3. | Ebenzer howard |
| S. | Central Place Theory | 4. | Harris and Ullman |
| | | 5. | Homer Hoyt |

(A) P – 1, Q – 4, R – 5, S – 3 (B) P – 4, Q – 2, R – 3, S – 1
(C) P – 5, Q – 1, R – 2, S – 3 (D) P – 5, Q – 4, R – 2, S – 1

28. The plan of a residential area with small houses on small plots has an urban fabric with
(A) fine grain and uniform texture (B) coarse grain and uniform texture
(C) fine grain and uneven texture (D) coarse grain and uneven texture

29. Match the 'Change Properties' command in AutoCAD (Group I) with the actions (Group II) it can perform on a given dashed line.

| Group I | | Group II | |
|---|---|---|---|
| P. | Elev | 1. | Changes the dashed line to a non-dashed line |
| Q. | L Type | 2. | Changes the size and spacing of the dashes |
| R. | Thickness | 3. | Changes the position along the Z axis |
| S. | Lt Scale | 4. | Changes the width of the line of the screen |
| | | 5. | Changes the height along the Z axis |
| | | 6. | Changes the position along the Y axis |

(A) P – 6, Q – 1, R – 4, S – 2 (B) P – 5, Q – 2, R – 6, S – 4
(C) P – 3, Q – 1, R – 5, S – 2 (D) P – 6, Q – 4, R – 3, S – 1

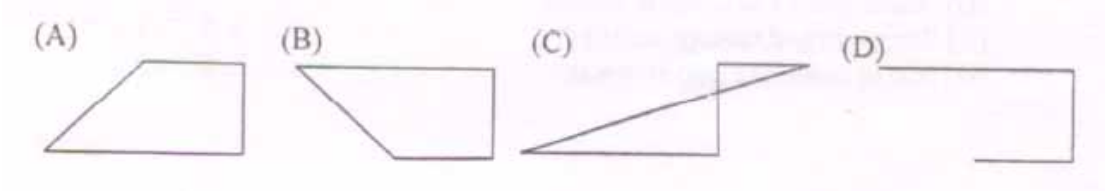
30. Match the statements on intelligent buildings in Group I with True/False in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | All intelligent buildings are examples of high-tech architecture | 1. | True |
| Q. | An intelligent building is synonymous with a smart building | 2. | False |
| R. | An intelligent building need not deploy a building automation system | | |
| S. | High-tech architecture always results in intelligent buildings | | |

(A) P – 1, Q – 1, R – 2, S – 2 (B) P – 1, Q – 2, R – 2, S – 2
(C) P – 2, Q – 2, R – 1, S – 1 (D) P – 2, Q – 1, R – 1, S – 1

31. The correct sequence of various components of a house water connection from the municipal water main is
(A) Stop rock → Water meter → Goose neck → Service pipe → Ferrule connection
(B) Ferrule connection → Stop cock → Goose neck → Service pipe → Water meter
(C) Goose neck → Ferrule connection → Service pipe → Water meter → Stop cock
(D) Ferrule connection → Goose neck → Service pipe → Stop cock → Water meter

32. The figure that will be generated by the following sequence of commands in AutoCad is
Command: pline
Specify start point: 0, 0
Specify next point: @50, 0
Specify next point: @0, –25
Specify next point: @25 < 180
Specify next point: c



33. A sector has a gross density of 250 persons per hectare and a net density of 400 persons per hectare. If the area of the sector is 120 hectares, then the percentage of non-residential area is
(A) 30 (B) 35.5 (C) 37.5 (D) 40

34. Match the systems of plumbing for building drainage in Group I with their descriptions in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | One-pipe system | 1. | Minimum two pipes, one for soil and the other for sullage |
| Q. | Two-pipe system | 2. | Single pipe for soil and sullage, and serving as vent for al traps |
| R. | Single stack system | 3. | Minimum two pipes, one for soil and sullage and the other for vent |
| | | 4. | Single pipe for soil and sullage, and serving as vent for soil traps only |

(A) P – 4, Q – 3, R – 2 (B) P – 3, Q – 2, R – 1
(C) P – 2, Q – 3, R – 4 (D) P – 3, Q – 1, R – 2

35. In a plane truss, the equation in terms of m and j is used to check its determinancy and stability, where m = number of members and j = number of joints. The truss is deficient and unstable when
(A) $m < 2j - 3$ (B) $m = 2j - 3$
(C) $m > 2j - 3$ (D) both (A) and (B) are correct

36. Match the functions in Group I with the numbers shown in the figure of concentric Zone Theory by Burgess.
Group I
P. Central Business District
Q. commuters' Zone
R. Workingmen's Homes
S. Zone of Better residences
T. Zone of Transition


(A) P – 1, Q – 2, R – 5, S – 4, T – 3 (B) P – 1, Q – 5, R – 3, S – 4, T – 2
(C) P – 2, Q – 4, R – 5, S – 3, T – 1 (D) P – 3, Q – 5, R – 1, S – 4, T – 2

37. For a PERT activity, the optimistic time, most likely time and pessimistic time are 1, 2 and 9 days respectively. The expected time for the activity (in days) is
(A) 9 (B) 6 (C) 4 (D) 3

38. Zoning regulations deal with

| | | | |
|---|---|---|---|
| P. | Density | S. | Minimum areas of rooms |
| Q. | Land use | T. | Height |
| R. | Building materials | U. | Reserved land areas |

(A) P, Q, T (B) P, Q, R, U (C) Q, S, U (D) Q, R, S, T

39. Match the temples in Group I with their distinguishing features in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | Konark | 1. | Golden Lily Pond |
| Q. | Kadurai | 2. | Sculpted Marble Ceiling |
| R. | Dilwara | 3. | Twin Vimanas |
| S. | Mamallapuram | 4. | Chariot |
| | | 5. | Torana |

(A) P – 3, Q – 1, R – 2, S – 5 (B) P – 4, Q – 1, R – 2, S – 3
(C) P – 2, Q – 3, R – 5, S – 1 (D) P – 3, Q – 4, R – 1, S – 2

40. The correct sequence of generic elements in a classical Order arranged from top to bottom is
(A) Architrave → Frieze → Capital → Cornice → Shaft → Pedestal → Base
(B) Architrave → Capital → Cornice → Frieze → Base → Shaft → Pedestal
(C) Cornice → Frieze → Architrave → Capital → Shaft → Base → Pedestal
(D) Cornice → Capital → Frieze → Architrave → Shaft → Pedestal → Base

41. Match the tree forms in Group I with their common examples in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | Broad | 1. | False Acacia |
| Q. | Tapering | 2. | Holly |
| R. | Conical | 3. | Lombardy Polar |
| S. | Columnar | 4. | Oak |
| | | 5. | Silver Maple |

(A) P – 1, Q – 5, R – 4, S – 2 (B) P – 1, Q – 3, R – 4, S – 5
(C) P – 4, Q – 1, R – 2, S – 3 (D) P – 4, Q – 5, R – 2, S – 1

42. A town has 16,000 existing dwelling units of which 10% are dilapidated. If the housing need is 8,700 dwellings units and the average household size is 4.5, then the population of the town is
(A) 64,800 (B) 1,03,950 (C) 1,11,150 (D) 1,18,350

43. Match the descriptions in Group I with the elements of Ornamentation in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | Painting on a freshly spread moist plaster surface with powdered pigments | 1. | Chiaroscuro |
| Q. | Figure incised into a stone surface or a metal plate yielding an impression in relief | 2. | Emboss |
| R. | Delicate or intricate design on lattice work allowing light through openings | 3. | Filigree |
| S. | Artistic composition consisting of motifs borrowed from different sources | 4. | Fresco |
| | | 5. | Intaglio |
| | | 6. | Pastiche |

(A) P – 1, Q – 2, R – 3, S – 5 (B) P – 1, Q – 5, R – 4, S – 6
(C) P – 4, Q – 2, R – 3, S – 1 (D) P – 4, Q – 5, R – 3, S – 6

44. Match the city plans in Group I with their designers in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | London | 1. | Eliel Saarinen |
| Q. | Berlin | 2. | Kenzo Tange |
| R. | Helsinki | 3. | Alvar Aalto |
| S. | Tokyo | 4. | Tadao Ando |
| | | 5. | Martin Machler |
| | | 6. | Patrick Abercrombie |

(A) P – 6, Q – 5, R – 1, S – 2 (B) P – 1, Q – 3, R – 5, S – 2
(C) P – 6, Q – 3, R – 1, S – 4 (D) P – 5, Q – 6, R – 3, S – 4

45. On a door opening with effective span l, the total weight (W) of an equilateral triangle on the base L is considered as a uniformly distributed load over the span. The bending moment for the door opening is given by
(A) WL / 2 (B) WL / 4 (C) WL / 6 (D) WL / 8

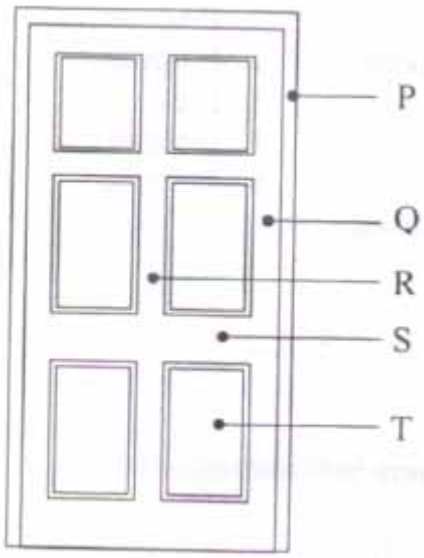
46. Match the descriptions in Group I with the traffic terminology in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | The length of a road ahead of the vehicle which should be visible to enable a driver to stop in case of an obstruction on the road | 1. | Visibility distance |
| Q. | Distance covered by a vehicle from the instant a driver sees an obstruction ahead and brings the vehicle to a stop | 2. | Sighting distance |
| R. | Distance required for a vehicle to overtake and safely pass another vehicle moving in the same direction but at a lower speed | 3. | Overtaking sight distance |
| | | 4. | Cross over distance |
| | | 5. | Stopping distance |

(A) P – 1, Q – 3, R – 4 (B) P – 4, Q – 3, R – 5
(C) P – 2, Q – 5, R – 4 (D) P – 2, Q – 5, R – 3

47. Match the labels on a paneled door in Group I with their names in Group II.

Group I




Group II

1. Jamb
2. Muntin
3. Panel
4. Rail
5. Saddle
6. Stile

(A) P – 1, Q – 6, R – 5, S – 4, T – 2 (B) P – 1, Q – 6, R – 2, S – 4, T – 3
(C) P – 5, Q – 3, R – 1, S – 6, T – 2 (D) P – 5, Q – 6, R – 1, S – 4, T – 3

48. A house was constructed 20 years ago at a cost of Rs. 1,00,000. The estimated life of the building is 50 years, at the end of which it will have a 15% scrap value of tis cost of construction. Its present value in Rupees is

(A) 36,000 (B) 66,000 (C) 75,000 (D) 85,000

49. A typical roof top Rainwater harvesting System essentially comprises of

P. roof catchment
Q. Down pipes
R. Rain gauge
S. Filter Chamber

(A) P, R (B) P, r, S (C) Q, R, S (D) P, Q, S

50. Match the architects in Group I with their works in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | Norman Foster | 1. | Petrons Towers |
| Q. | Cesar Pelli | 2. | Kansai Airport |
| R. | Richard Meier | 3. | HSBC, Hongkong |
| S. | Renzo Piano | 4. | The Atheneum |
| | | 5. | Sydney Opera House |

(A) P – 3, Q – 1, R – 4, S – 2 (B) P – 4, Q – 1, R – 2, S – 3
(C) P – 3, Q – 2, R – 5, S – 1 (D) P – 5, Q – 3, R – 1, S – 2

51. A single room of 3 metres × 5 metres enclosed by 20 cm thick wals has to be constructed. The required foundation trench is 80 cm wide and 80 cm deep. The quantity of earthwork in excavation in cubic metres is

(A) 10.75 (B) 12.80 (C) 18.70 (D) 20.24

52. Match the parts of a tree log in Group I with their descriptions in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | Heartwood | 1. | Outer annual rings of the tree |
| Q. | Sapwood | 2. | Thin horizotnla veins radiating from the pith towards the bark |
| R. | Cambium Layer | 3. | Outermost protective covering of the log |
| S. | Medullary Rays | 4. | Outermost protective covering of the log |
| | | 5. | Outermost one ring between the bark and sapwood |

(A) P – 4, Q – 2, R – 5, S – 3 (B) P – 3, Q – 5, R – 4, S – 1
(C) P – 4, Q – 1, R – 5, S – 2 (D) P – 5, Q – 1, R – 4, S – 2

53. The quantity of plastering in sq. m required for both sides of a wall 5.0 m × 0.30 m × 3.0 m (L × B × H) with a window opening 2.0 m × 0.30 m × 1.2 m is

(A) 25.2 (B) 27.6 (C) 30.0 (D) 34.8

54. Match the urban theorists in Group I with the planning concepts in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | Patrick Geddes | 1. | Cities in evolution and their relationship with man |
| Q. | Charles Abrams | 2. | Judicious use of technological power |
| R. | Constantine Doxiadis | 3. | Role of housing in urban development |
| S. | Lewis Mumford | 4. | The science of human settlements called Ekistics |

(A) P – 1, Q – 3, R – 4, S – 2 (B) P – 4, Q – 2, R – 3, S – 1
(C) P – 3, Q – 4, R – 1, S – 2 (D) P – 2, Q – 1, R – 4, S – 3

55. If the reinforcement steel provided for a RCC slab of volume 15.0 cu.m. is @ 1%, then the quantity of steel required in kilograms is

(A) 655.5 (B) 1,000.0 (C) 1,1775.5 (D) 1,500.0

56. The prairie House design of Frank Lloyd Wright is characterised by
P. Horizontal planes
Q. Extended roofs
R. Focal fire place
S. Steel columns
T. Verticla Screen windows

(A) P, R, S (B) P, Q, S (C) Q, R, S, T (D) P, Q, R, T

57. Match the window types in Group I with their descriptions in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | Bay window | 1. | Horizontal louvers pivoting simultaneously in common frame |
| Q. | Pivoted window | 2. | A sash that rotates 90° or 180° about a vertical or horizontal axis at or near its centre |
| R. | Dormer window | 3. | Projecting outward from the main wall of a building, forming an alcove within a room |
| | | 4. | Vertical window projecting out of a sloping roof |

(A) P – 3, Q – 2, R – 4 (B) P – 2, Q – 3, R – 1
(C) P – 1, Q – 4, R – 2 (D) P – 4, Q – 2, R – 3

58. Match the housing projects in Group I with the architects in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | Tara Group Housing, New Delhi | 1. | Balkrishna Doshi |
| Q. | Marine Front Housing, Cochin | 2. | Charles Correa |
| R. | Aranya Community Housing, Indore | 3. | Hasmukh Patel |
| S. | Asiad Village, New Delhi | 4. | Kuldip Singh |
| | | 5. | Laurie Baker |
| | | 6. | Raj Rewal |

(A) P – 2, Q – 4, R – 1, S – 6 (B) P – 3, Q – 4, R – 2, S – 6
(C) P – 2, Q – 5, R – 6, S – 1 (D) P – 1, Q – 5, R – 3, S – 6

59. A beam of 50 mm diameter is simply supported at both ends and has an effective span of 6 metres. It carries two load of 50 kN each at one-third span. The section modulus (in $cm^3$) of the beam at the quarter span is

(A) 11.17 (B) 12.27 (C) 13.37 (D) 14.47

60. Match the Earthquake related terms in Group I with their definitions in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | Focus | 1. | The geographical point on the earth' surface vertically above the originating source |
| Q. | Epicenter | 2. | The originating source of the seismic waves inside the earth |
| R. | Centre of Mass | 3. | The point corresponding to the centre of gravity of a structural system |
| S. | Centre of Stiffness | 4. | The point through which the resultant of the restoring forces of a structural system act |

(A) P – 1, Q – 2, R – 3, S – 4 (B) P – 1, Q – 2, R – 4, S – 3
(C) P – 2, Q – 1, R – 3, S – 4 (D) P – 2, Q – 1, R – 4, S – 3

61. Match the architectural styles in Group I with the construction system in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | Greek | 1. | Semi-circular arch |
| Q. | Roman | 2. | Trabeation |
| R. | Indian | 3. | Corbelling |
| S. | Gothic | 4. | Pointed arch |

(A) P – 2, Q – 4, R – 3, S – 1 (B) P – 1, Q – 2, R – 4, S – 3
(C) P – 2, Q – 1, R – 3, S – 4 (D) P – 3, Q – 1, R – 2, S – 4

62. For incandescent lamps the distribution of total energy emission is
(A) 5% light & 95% heat
(B) 25% light and 75% heat
(C) 50% light & 50% heat
(D) 75% light & 25% heat

63. Match the characteristics in Group I with the climate types in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | High humidity accelerates rusting and rotting | 1. | Composite or monsoon |
| Q. | High daytime temperature and rapid cooling at night cause materials to crack | 2. | Hot dry desert |
| R. | Seasonal changes in relative humidity cause rapid weakening of building materials | 3. | Hot dry maritime |
| | | 4. | Tropical Upland |
| | | 5. | Warm humid |

(A) P – 5, Q – 2, R – 1 (B) P – 4, Q – 1, R – 3
(C) P – 5, Q – 3, R – 4 (D) P – 4, Q – 3, R – 5

64. The architectural projects of the International Style are
P. Aurora House by Aldo Rossi
Q. Schroder House by Gerrit Reitveld
R. Tugendhat House by Mies van der Rohe
T. Villa Savoye by Le Corbusier
(A) P, Q, R, T (B) P, S (C) Q, S, T (D) Q, R, T

65. Tactile flooring with guiding blocks, an element of Barrier Free Design, is used to aid
P. ambulant disabled
Q. non-ambulant disabled
R. partially sighted
S. totally blind
(A) P, Q, S (B) P, Q, R (C) R, S (D) Q, S

66. Match the characteristics of vaults in Group I with their names in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | Uniform semi-circular cross section | 1. | Barrel |
| Q. | Semi-circular cross section larger at one end than the other | 2. | Cloister |
| R. | Compound vault formed by four coves meeting along diagonal vertical planes | 3. | Conical |
| S. | | 4. | Groin |
| | | 5. | Rampant |
| | | 6. | Stilted |

(A) P – 1, Q – 6, R – 5, S – 2 (B) P – 6, Q – 3, R – 4, S – 2
(C) P – 4, Q – 5, R – 2, S – 6 (D) P – 1, Q – 3, R – 4, S – 2

67. A 60° segmental arch is provided over a door of 1.0 m width. The wall thickness is 30 cm and the arch thickness is 20 cm. the mean length of the arch in metres is
(A) 1.00 (B) 1.15 (C) 1.20 (D) 1.30

68. Match the statements about elevators & escalators in Group I with True/False in Group II.

| Group I | | Group II | |
|---|---|---|---|
| P. | Handling capacity of elevators for residential buildings as per Indian standards is 7.5% | 1. | True |
| Q. | Minimum height from the top floor to the bottom of the lift machine room should be 3,000 | 2. | False |
| R. | Minimum width for escalators as per Indian standards is 1,000 mm | | |
| S. | Recommended angle with the horizontal for escalators is 30° | | |

(A) P – 1, Q – 2, R – 1, S – 2 (B) P – 2, Q – 2, R – 2, S – 1
(C) P – 2, Q – 1, R – 1, S – 1 (D) P – 1, Q – 2, R – 2, S – 1

69. The slenderness ratio for a cantilever prismatic column of length L with a circular cross section having radius r is
(A) L / r (B) 2L / r (C) 3L / r (D) 4L / r

70. Match the designers in Group I with the terms in Group II

| Group I | | Group II | |
|---|---|---|---|
| P. | Max Dubois | 1. | Prefabrication |
| Q. | Joseph Paxton | 2. | Domino System |
| R. | Victor Horta | 3. | Minimalism |
| | | 4. | Vegetal Ornamentation |

(A) P – 2, Q – 1, R – 4 (B) P – 4, Q – 1, R – 3
(C) P – 2, Q – 4, R – 3 (D) P – 1, Q – 3, R – 4

## Common Data Questions

**Common Data for Questions 71, 72, 73:**
The continuous utility data for a construction project is as follows:

| Activity | During (days) | | Immediate Predecessors |
|---|---|---|---|
| | Normal | Crash | |
| P | 3 | 3 | - |
| Q | 4 | 4 | P |
| R | 2 | 1 | P |
| S | 2 | 1 | P |
| S | 3 | 3 | P |
| T | 0 | 0 | Q |
| U | 6 | 5 | R, T |
| V | 4 | 2 | S |

71. The normal project time for the given network is
(A) 11 (B) 12 (C) 13 (D) 14

72. For the all-normal solution, the total float and free float for the activity s are
(A) 1, 1 (B) 0, 3 (C) 3, 3 (D) 3, 0

73. While crashing the project, the first step of compression would involve the activity
(A) R (B) U (C) T (D) V

**Common Data for Questions 74, 75:**
A room measuring 10 m $\times$ 10 m has to be illuminated to a level of 200 lux by a single electric lamp. The coefficient of utilization is 0.75 and the maintenance factor is 0.8.

74. The lumen output required for the above lamp is
(A) 12,000 (B) 16,666 (C) 30,000 (D) 33,333

75. The depreciation factor for the above lamp is
(A) 0.6 (B) 1.25 (C) 1.33 (D) 1.66

## Linked Answer Questions: Q. 76 to Q. 85 carry two marks each.

**Statement for Linked Answer Questions 76 & 77:**
The following data is related to the design of a septic tank for a housing complex:
Population of housing complex = 150
Water supply / person / day = 130 litres
Waste water flow = 80% of water supply
Detention period = 1 day
Sludge production = 0.045 cu.m / person / year
Storage capacity for sludge = 1/3$^{rd}$ of septic tank capacity

76. Total capacity of septic tank in cubic metres is
(A) 31.70 (B) 23.40 (C) 20.80 (D) 15.60

77. De-sludging interval (to the nearest year) is
(A) 1 (B) 2 (C) 3 (D) 4

**Statement for Linked Answer Questions 78 & 79:**
A residential plot measuring 12 metres × 15 metres abuts a road on its smaller side. Permissible ground coverage = 50 %, floor Space Index (FSI) = 2.5 and maximum permissible floors = 4

78. maximum total buildable area in sq. m is
(A) 180 (B) 225 (C) 360 (D) 450

79. As per revised building bye-laws, If the required setbacks are - Front 3 metres, each Side 2 metres and Rear 2 metres, then the maximum total buildable area will
(A) increase by 248 sq. m (B) increase by 40 sq. m
(C) decrease by 30 sq. m (D) decrease by 40 sq. m

**Statement for Linked Answer Questions 80 & 81**
A aerial photograph is taken from a plane with a camera lens of focal length 308 mm. the desired scale of the photograph is 1:25,000 and the height of the terrain above mean sea level is 300 metres.

80. The flying height of the plane above mean sea level is
(A) 7,625 (B) 7,925 (C) 8,562 (D) 8,965

81. If the above photograph is taken by a camera lens of focal length 210 mm from the same flying height, then the scale of the photograph will be
(A) 1: 45,000 (B) 1 : 37,740 (C) 1 : 36,310 (D) 1 : 19,050

**Statement for Linked Answer Questions 82 & 83:**
A beam of cross section 300 mm × 400 mm has overhangs at both ends. The beam has a simple support of 10 metres and an overhang of 5 metres each at both ends and carrying a load of 10 kN on both the free ends.

82. The maximum values of shear force and bending moment in the beam are
(A) 5 kN, 50 kN-m (B) 20 kN, 80 kN-m
(C) 15 kN, 45 kN-m (D) 10 kN, 50 kN-m

83. The maximum values of bending stress and shear stress developed in the beam in $N/mm^2$ are
(A) 5.15, 0.1 (B) 6.25, 0.125 (C) 7.35, 0.15 (D) 8.45, 0.175

Statement for Linked Answer Questions 84 & 85:
An auditorium has a volume of 3000 $m^3$ with optimum reverberation time of 0.8 seconds.

84. The sound absorption power required in the auditorium in $m^2$-sabins is approximately
(A) 250 (B) 400 (C) 600 (D) 800

85. During a convocation programme in the same auditorium, the absorption power increases by 200 $m^2$-sabins. The reverberation time in seconds will now be
(A) 0.4 (B) 0.6 (C) 0.8 (D) 1.2

# End of Question Paper