2024 - AR : Architecture and Planning Exam

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16th August, 2025

Duration: Three Hours   Maximum Marks:100

General Aptitude (GA)

1. If '→' denotes increasing order of intensity, then the meaning of the words [sick → infirm → moribund] is analogous to [silly → _____ → daft]. Which one of the given options is appropriate to fill the blank?

    (a) frown   (b) fawn   (c) vein   (d) vain

    (GATE-AR 2024)

2. The 15 parts of the given figure are to be painted such that no two adjacent parts with shared boundaries (excluding corners) have the same color. The minimum number of colors required is
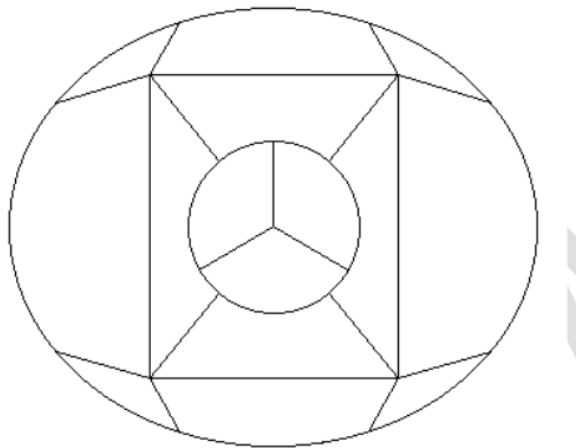

Figure 1

    (a) 4   (b) 3   (c) 5   (d) 6

    (GATE-AR 2024)

3. How many 4-digit positive integers divisible by 3 can be formed using only the digits $\{1, 3, 4, 6, 7\}$, such that no digit appears more than once in a number?

    (a) 24   (b) 48   (c) 72   (d) 12

    (GATE-AR 2024)

4. The sum of the following infinite series is $2 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{8} + \frac{1}{9} + \frac{1}{16} + \frac{1}{27} + \cdots$

    (a) $\frac{11}{3}$ (b) $\frac{7}{2}$ (c) $\frac{13}{4}$ (d) $\frac{9}{2}$

    (GATE-AR 2024)

5. In an election, the share of valid votes received by the four candidates A, B, C, and D is represented by the pie chart shown. The total number of votes cast in the election were 1,15,000, out of which 5,000 were invalid. Based on the data provided, the total number of valid votes received by the candidates B and C is
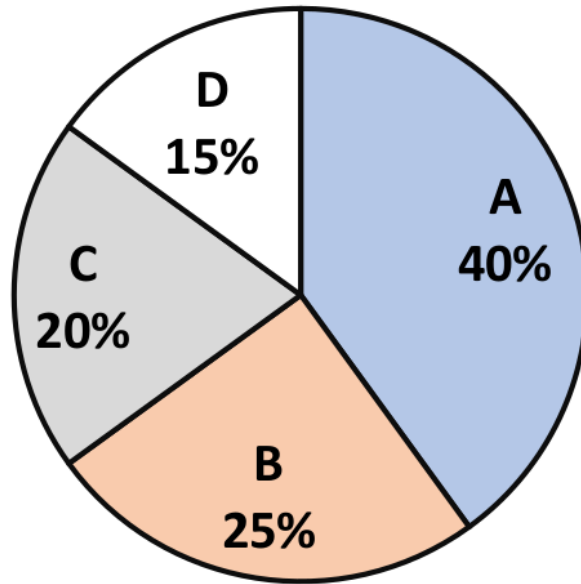
Figure 2: Share of Valid Votes

    (a) 45,000   (b) 49,500   (c) 51,750   (d) 54,000

<div align="right">(GATE-AR 2024)</div>

6. Thousands of years ago, some people began dairy farming. This coincided with a number of mutations in a particular gene that resulted in these people developing the ability to digest dairy milk. Based on the given passage, which of the following can be inferred?

    (a) All human beings can digest dairy milk.

    (b) No human being can digest dairy milk.

    (c) Digestion of dairy milk is essential for human beings.

    (d) In human beings, digestion of dairy milk resulted from a mutated gene.

<div align="right">(GATE-AR 2024)</div>

7. The probability of a boy or a girl being born is $\frac{1}{2}$. For a family having only three children, what is the probability of having two girls and one boy?

    (a) $\frac{3}{8}$ (b) $\frac{1}{8}$ (c) $\frac{1}{4}$ (d) $\frac{1}{2}$

<div align="right">(GATE-AR 2024)</div>

8. Person 1 and Person 2 invest in three mutual funds A, B, and C. The amounts they invest in each of these mutual funds are given in the table.

	Mutual fund A	Mutual fund B	Mutual fund C
Person 1	Rs.10,000	Rs.20,000	Rs.20,000
Person 2	Rs.20,000	Rs.15,000	Rs.15,000

At the end of one year, the total amount that Person 1 gets is Rs.500 more than Person 2. The annual rate of return for the mutual funds B and C is 15% each. What is the annual rate of return for the mutual fund A?

    (a) 7.5%   (b) 10%   (c) 15%   (d) 20%

<div align="right">(GATE-AR 2024)</div>

9. Three different views of a dice are shown in the figure below.
   The piece of paper that can be folded to make this dice is
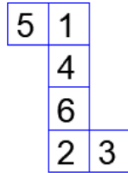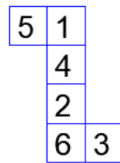

Figure 3: Dice
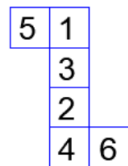

Figure 4

(a)

Figure 5
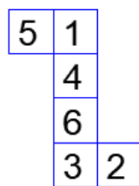
(b)

Figure 6

(c)

Figure 7

(d)

(GATE-AR 2024)

10. Visualize two identical right circular cones such that one is inverted over the other and they share a common circular base. If a cutting plane passes through the vertices of the assembled cones, what shape does the outer boundary of the resulting cross-section make?

(a) A rhombus   (b) A triangle   (c) An ellipse   (d) A hexagon

(GATE-AR 2024)

PART A: Common FOR ALL CANDIDATES

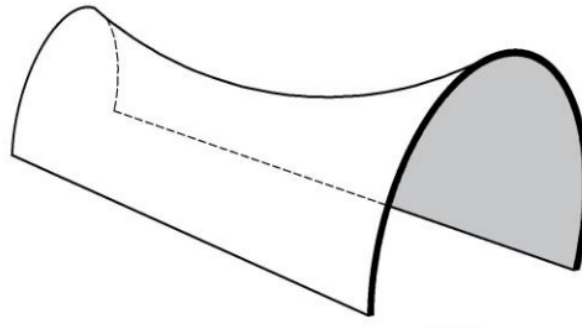11. The nature of curvature of the following structural form is

Figure 8

(a) monoclastic   (b) synclastic   (c) anticlastic   (d) mobius

(GATE-AR 2024)

12. As per the Ekistics Logarithmic Scale, the 'world city' is referred as

(a) Megalopolis   (b) Conurbation   (c) Acropolis   (d) Ecumenopolis

(GATE-AR 2024)

13. In Manasara Silpasastra, a bow-shaped town plan is known as

(a) Dandaka   (b) Prastara   (c) Karmuka   (d) Nandyavarta

(GATE-AR 2024)

14. The value of a property when sold at a lower price than its open market price is called

(a) Distress Value   (c) Speculative Value

(b) Accommodation Value   (d) Replacement Value

(GATE-AR 2024)

15. In a traffic survey, Enoscope is used to measure

(a) Volume to Capacity ratio   (b) Sight distance   (c) Spot speed   (d) Intersection delay

(GATE-AR 2024)

16. The author of the book Human Aspects of Urban Form is

(a) Cliff Moughtin   (b) Amos Rapoport   (c) Peter Katz   (d) Lewis Mumford

(GATE-AR 2024)

17. Which of the following statements is correct for Urban Cool Island (UCI)?

(a) The UCI and Urban Heat Island (UHI) cannot happen in a city at the same time.

(b) Air temperature of surrounding rural areas is warmer than that of the urban areas.

(c) Air temperature of surrounding rural areas is cooler than that of the urban areas.

(d) UCI happens only in a snow-clad mountain.

18. Which of the following statements is correct for an oxidation pond to treat waste water?

    (a) It is an aerobic pond.

    (b) It is an anaerobic pond.

    (c) It does not require sunlight.

    (d) It does not remove Biological Oxygen Demand (BOD).

19. The conservation architect of the Maitreya Buddha Temple at Basgo, Ladakh which won the 2007 UNESCO Asia-Pacific Heritage Award is

    (a) Abha Narain Lambah

    (b) Vinod Kumar M. M.

    (c) Rahul Mehrotra

    (d) Saima Iqbal

20. Which of the following options is/are the right sequence(s) in water treatment process?

    (a) Coagulation → Flocculation → Sedimentation

    (b) Sedimentation → Filtration → Disinfection

    (c) Sedimentation → Flocculation → Coagulation

    (d) Disinfection → Filtration → Flocculation

21. Which of the following is/are associated with Gentrification in a neighbourhood?

    (a) Wealthier households displace poor households

    (b) Poor households displace wealthier households

    (c) Real estate value increases

    (d) Real estate value decreases

22. Which of the following sites is/are included in the UNESCO World Heritage List as on December 2022?

    (a) Capitol Complex, Chandigarh

    (b) Moth ki Masjid, Delhi

    (c) Keoladeo National Park, Bharatpur

    (d) Paradesi Synagogue, Kochi

23. The reference points, lines and planes for drawing a two-point perspective of an object are marked in the Figure below. Select the correct option(s) that match(es) with the corresponding nomenclature.
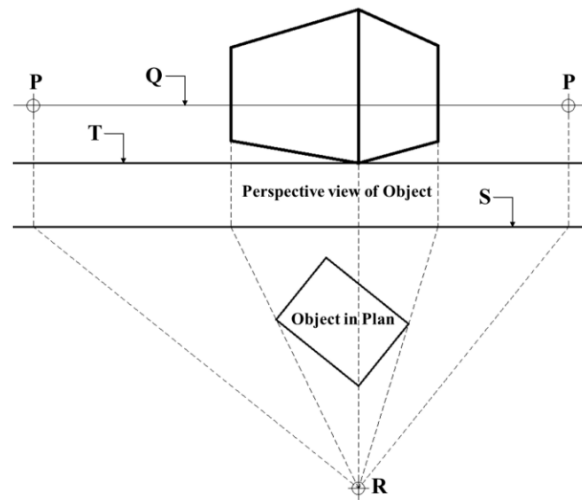

Figure 9

    (a) R – Station point, S – Picture plane

    (b) R – Vanishing point, T – Picture plane

    (c) P – Vanishing point, T – Ground line

    (d) Q – Ground line, S – Horizon line

(GATE-AR 2024)

24. India's intended Nationally Determined Contribution to the United Nations Framework Convention on Climate Change in 2022 include(s)

    (a) reduction of emissions intensity of India's GDP by 45% by 2030 from 2005 level

    (b) achieving about 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030

    (c) achieving the target of net-zero emission by 2030

    (d) reduction of total projected carbon emission by one billion tonnes from 2022 to 2025

(GATE-AR 2024)

25. As per the Census of India 2011, non-notified slums is/are categorised as

    (a) Recognised   (b) Identified   (c) Unrecognised   (d) Authorised

(GATE-AR 2024)

26. Which of the following is/are under the purview of the Energy Conservation Building Code of India 2017?

    (a) Indoor Lighting   (c) Plug Loads

    (b) Outdoor Lighting   (d) Embodied Energy

(GATE-AR 2024)

27. Which of the following is/are used for municipal fiscal resource mobilisation?

    (a) Property tax   (c) Income tax

    (b) Development charges   (d) Salary of municipal staff

(GATE-AR 2024)

28. A ramp with a slope of 1:12 is required for wheelchair access. Intermediate landings of length 1.5 m each have to be provided after every 9 m running length. The running length of a straight ramp including landing, to negotiate a level difference of 900 mm vertical height, in m, is _____ (rounded off to two decimal places).
   (GATE-AR 2024)

29. Match the features in **Group—I** with the corresponding software tools in **Group—II**.

Group—I	Group—II
(P) Raster Graphics Editing	(1) OpenStudio
(Q) Energy Modeling	(2) GIMP
(R) Visual Programming Interface	(3) STAAD
(S) Structural Analysis	(4) Grasshopper
	(5) Radiance

   (a) P—3, Q—1, R—2, S—5   (c) P—1, Q—4, R—5, S—2

   (b) P—2, Q—1, R—4, S—3   (d) P—2, Q—5, R—1, S—3

   (GATE-AR 2024)

30. Match the elements in **Group—I** with the corresponding buildings in **Group—II**.

Group—I	Group—II
(P) Lightweight Structure	(1) Taipei 101, Taipei by Lee and Wang
(Q) Base Isolator	(2) The Gherkin, London by Foster & Partners
(R) Tuned-mass Damper	(3) Museum of New Zealand Te Papa Tongarewa, Wellington by Ivan Mercep
(S) Diagrid	(4) Paper Log Houses, Kobe by Shigeru Ban
	(5) Metropolitan Cathedral of Christ the King, Liverpool by Lutyens and Gibberd

   (a) P—1, Q—3, R—5, S—4   (c) P—4, Q—1, R—5, S—2

   (b) P—4, Q—3, R—1, S—2   (d) P—3, Q—2, R—1, S—5

   (GATE-AR 2024)

31. Match the following concepts in **Group—I** with their corresponding description in **Group—II**.

Group—I	Group—II
(P) N I M B Y	(1) Affording a clear view of the waterfront to a plot through the abutting street
(Q) Form based code	(2) Planning and zoning tool to regulate development primarily through urban form
(R) Tactical urbanism	(3) Establishment of residential areas on the outskirts of a city
(S) Suburbanisation	(4) Short-term, low cost, scalable interventions and policies to change a neighbourhood
	(5) Resisting any physical intervention by public or private enterprises within their neighbourhood

   (a) P—5, Q—2, R—4, S—3   (c) P—1, Q—2, R—4, S—5

   (b) P—5, Q—4, R—3, S—2   (d) P—1, Q—5, R—4, S—3

   (GATE-AR 2024)

32. Match the urban renewal projects in **Group—I** with the corresponding cities in **Group—II**.

Group—I	Group—II
(P) Cheonggyecheon	(1) New York
(Q) The High Line	(2) London
(R) False Creek South	(3) Seoul
(S) Canary Wharf	(4) Vancouver
	(5) Tokyo

(a) P—3, Q—1, R—4, S—2   (c) P—5, Q—1, R—2, S—3

(b) P—3, Q—5, R—1, S—2   (d) P—2, Q—5, R—4, S—3

33. Match the Biosphere Reserves in **Group—I** with their corresponding features in **Group—II**.

Group—I	Group—II
(P) Gulf of Mannar	(1) Ridge, Glacier
(Q) Sunderbans	(2) Sub-tropical/Tropical Forest, Stepped Hill
(R) Nanda Devi	(3) Swamp forest, Mangrove
(S) Nilgiri	(4) Coral Reefs, Seagrass bed
	(5) Salt Marsh, Flat Terrain

(a) P—1, Q—3, R—4, S—5   (c) P—4, Q—3, R—1, S—2

(b) P—3, Q—5, R—1, S—2   (d) P—4, Q—2, R—3, S—5

34. Match the terminologies in **Group—I** with their descriptions in **Group—II**.

Group—I	Group—II
(P) Edge City	(1) Rapid expansion of geographical areas of towns or cities
(Q) Synekism	(2) Violence against the city
(R) Urbicide	(3) A secondary CBD on the edge of the city
(S) Urban Sprawl	(4) Rebuilding core city area
	(5) Union of several small urban settlements under one rule

(a) P—3, Q—5, R—2, S—1   (c) P—2, Q—5, R—3, S—1

(b) P—3, Q—4, R—2, S—5   (d) P—4, Q—2, R—3, S—1

35. Match the items in **Group—I** with their corresponding items in **Group—II**.

Group—I	Group—II
(P) Floating floor	(1) Overflow control
(Q) Float valve	(2) Delay not affecting a project
(R) Metal float	(3) Acoustical buffer
(S) Free float	(4) Plastering equipment
	(5) Traffic flow control

(a) P—3, Q—2, R—4, S—1   (b) P—5, Q—1, R—3, S—4   (c) P—3, Q—1, R—4, S—2   (d) P—1, Q—2, R—5, S—4

36. As per the URDPFI Guidelines 2015, match the type of educational facilities in **Group—I** with the corresponding minimum population to be served per facility in **Group—II**.

Group—I	Group—II
(P) Integrated school	(1) 4,000
(Q) Senior secondary school	(2) 2,500
(R) College	(3) 90,000
(S) Primary school	(4) 1,25,000
	(5) 7,500

(a) P—4, Q—2, R—3, S—1   (c) P—2, Q—5, R—1, S—3

(b) P—3, Q—5, R—4, S—1   (d) P—3, Q—2, R—4, S—5

37. Which of the following statements is/are true?

(a) Physiological Equivalent Temperature is used in outdoor thermal comfort evaluation.

(b) Thermal Performance Index is computed using outside surface temperature of building envelope.

(c) Reynolds number less than 2000 refers to laminar wind flow.

(d) Reynolds number greater than 4000 refers to turbulent wind flow.

38. Which of the following statements is/are correct?

(a) Yellow, blue-violet and red-violet are split complementary hues.

(b) Orange, green and violet are analogous combinations.

(c) CMYK is a subtractive colour system.

(d) Blue, green, orange and red are tetrad combinations.

39. Which of the following statements is/are correct?

(a) The Royal Botanical Garden is in Kew, England.

(b) The Villa d'Este is in Tivoli, Italy.

(c) Indira Gandhi Memorial Tulip Garden is in Srinagar, J&K, India.

(d) Shinjuku Gyoen National Garden is in Beijing, China.

40. Which of the following statements is/are correct?

(a) Hibiscus or china rose (Hibiscus rosa-sinensis) is a shrub which has red, pink, white, and yellow blossoms.

(b) Frangipani, champa, and plumeria alba are names of the same flowering tree.

(c) Jacaranda (Jacarenda mimisifolia), gulmohar (delonix regia), and amaltas (laburnum) are flowering trees.

(d) The fruit of the Kadam/cadamba tree (Neolamarckia cadamba) is conical in shape and poisonous for humans.

41. Which of the following is/are component(s) of Right of Way (RoW) of a road?

(a) Building line   (b) Kerb   (c) Carriageway   (d) Sidewalk

42. As per the National Building Code of India 2016, terminologies associated with fire fighting in a building is/are

(a) Refuge area   (c) Panic bar

(b) Water sprinkler system   (d) Atrium

43. For the beam shown below, ignoring the self-weight, the maximum hogging moment (in kN·m) generated for the loads indicated is _____ (rounded off to one decimal place).
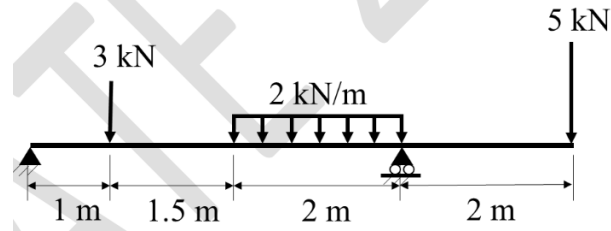
Figure 10: Beam

44. At present, the cost of a new office equipment is 50,000 (in Indian Rupees). It has 15% salvage value after a useful life of 5 years. Using straight line method of depreciation, the book value of the equipment 3 years from now, in Indian Rupees, will be _____ (in integer).
(GATE-AR 2024)

45. The network diagram of a construction project is shown in the following Figure. The duration of each activity, in days, and the early start time of the project are denoted in the diagram. The total project duration along the critical path, in days, is _____ (in integer). (GATE-AR 2024)
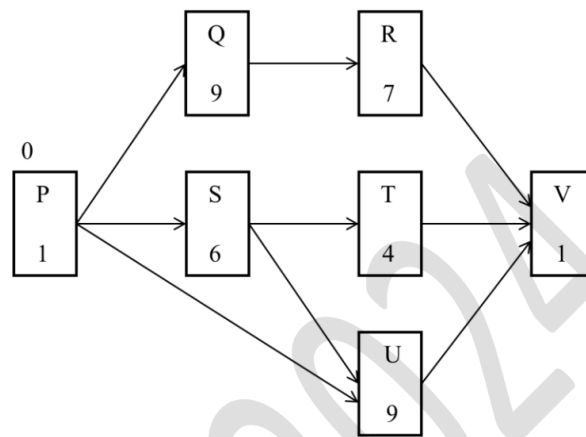

Figure 11

46. The design of a 1200 capacity concert hall considers $\frac{1}{3}$rd female audience and $\frac{2}{3}$rd male audience. The Table below shows the guideline for calculating Water Closet requirements.

Fixture	Male	Female
Water closet	1 number per 100 up to 400 and over 400, 1 number for every 250 or part thereof	3 numbers per 100 up to 200 population and over 200, 2 numbers for every 100 or part thereof

Using the above guideline, the number of Water Closets required for the total audience is _____ (in integer).
(GATE-AR 2024)

47. A declining Industrial Town has proposed to improve water sustainability by reducing stormwater runoff through change of land use land cover (LULC), as shown in the Table below, to attract new residents.

LULC	Runoff Coefficient	Existing Area in hectare	Proposed Area in hectare
Industrial	0.7	1500	800
Residential	0.5	1000	1200
Park and Playgrounds	0.25	1200	1000
Forest	0.15	300	1000

Considering a flat topography and zero additional runoff from the adjoining areas, the reduction in run-off generation for a 400 mm rainfall event in the industrial town for the proposed intervention, in cubic meters,

is _____ $\times 10^6$ (rounded off to two decimal places).
(GATE-AR 2024)

48. A real estate developer is developing a township on a PPP mode. The total area of the site is 2.672 hectares with an allowable FAR of 2.25, of which 20% is earmarked for MIG category. The gross area of each MIG unit including common areas and services is 72 m^2. Assuming super built up area to be same as FAR, the maximum number of MIG apartments that can be constructed is _____ (in integer).
(GATE-AR 2024)

49. A municipal town requires a volume of 70,000 m^3 compacted solid waste to fill a low lying land. The city has a total of 10,000 households.

Type of House	Percentage of Households	Equivalent volume of compacted solid waste generated/ household/ day
LIG	30%	0.10 m^3
MIG	60%	0.15 m^3
HIG	10%	0.20 m^3

Using the information as shown in the Table above, the estimated minimum number of days required to fill the low lying land is _____ (in integer).
(GATE-AR 2024)

PART B1: FOR Architecture CANDIDATES ONLY

50. Rose window is a characteristic feature of

    (a) Great Temple of Ammon, Karnak, Egypt

    (b) Temple of Jupiter, Baalbek, Lebanon

    (c) Notre-Dame, Paris, France

    (d) Humayun Tomb, Nizamuddin, Delhi

    (GATE-AR 2024)

51. The schematic diagram of a unitary air-conditioner operating in cooling mode, is shown in the following Figure. The component P marked in the figure represents
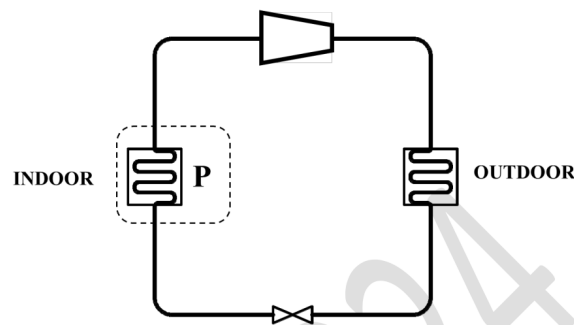

Figure 12: Unitary Air-Conditioner

    (a) Condenser   (b) Evaporator   (c) Compressor   (d) Expansion valve

    (GATE-AR 2024)

52. Titan Integrity Campus, Bengaluru is designed by

    (a) Christopher C. Benninger   (c) Raj Rewal

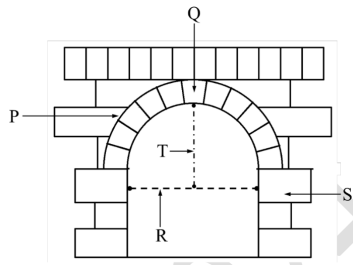   (b) Sanjay Mohe   (d) Anant Raje

    (GATE-AR 2024)

Figure 13

53. With reference to the Figure above, which of the following labelling is/are correct?

   (a) P – Extrados, Q – Key , R – Span

   (b) Q – Key, S – Abutment, T – Rise

   (c) P – Abutment, R – Rise, T – Extrados

   (d) Q – Key, S – Span, T – Extrados

<div align="right">(GATE-AR 2024)</div>

54. Which of the following buildings has/have pendentives as a structural element?

   (a) St. Mark's Basilica, Venice, Italy

   (b) Westminster Cathedral, London, UK

   (c) Dilwara Temple, Mount Abu, India

   (d) Hagia Irene Museum and Concert Hall, Istanbul

<div align="right">(GATE-AR 2024)</div>

55. Polytetrafluroethylene (PTFE) coated fiberglass has been used as a roofing membrane in

   (a) Jawaharlal Nehru Stadium, New Delhi

   (b) Eden Gardens Stadium, Kolkata

   (c) Melbourne Cricket Ground Stadium, Melbourne

   (d) Beijing National Stadium, Beijing

<div align="right">(GATE-AR 2024)</div>

56. A non-stop express elevator directly connects the observatory level at 80th floor of a tower with the podium at 2nd floor level. The tower has a uniform floor-floor height of 4 m. The elevator attains a maximum speed of 8 m/s. Assume 2 m/s^2 as net vertical acceleration and net vertical deceleration (incorporating gravity). If the elevator starts from a state of rest from the podium, the time taken to reach the observatory, in seconds, is _____ (rounded off to one decimal place).
(GATE-AR 2024)

57. Match the elements in **Group—I** with the corresponding religious buildings in **Group—II**.

Group—I	Group—II
(P) Bell capital	(1) Mosque
(Q) Mehrab	(2) Hindu Temple
(R) Gopuram	(3) Greek Temple
(S) Pediment	(4) Romanesque Church
	(5) Egyptian Temple

   (a) P—5, Q—1, R—2, S—3   (c) P—5, Q—4, R—3, S—2

   (b) P—3, Q—1, R—5, S—4   (d) P—4, Q—1, R—2, S—3

<div align="right">(GATE-AR 2024)</div>

58. Match the museums in **Group—I** with their architects in **Group—II**.

Group—I	Group—II
(P) Indira Gandhi Rashtriya Manav Sangrahalaya, Bhopal	(1) Charles Correa
(Q) Bihar Museum, Patna	(2) Ram Sharma
(R) Gandhi Memorial Museum, Ahmedabad	(3) Romi Khosla
(S) Museum of Art and Photography, Bengaluru	(4) Soumitro Ghosh & Nisha Mathew
	(5) Fumihiko Maki

(a) P—4, Q—5, R—3, S—1

(b) P—4, Q—3, R—1, S—2

(c) P—2, Q—3, R—1, S—4

(d) P—2, Q—5, R—1, S—4

59. Match the specially shaped bricks in **Group—I** with their corresponding nomenclature in **Group—II**.
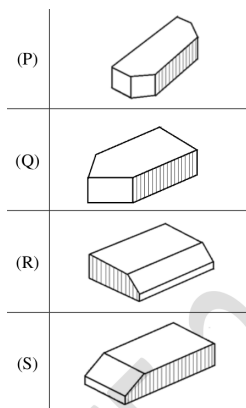**Group-I**

Figure 14: Bricks

Group—II
(1) Plinth Header
(2) Bird's mouth
(3) Squint
(4) Double cant
(5) Plinth stretcher

(a) P—4, Q—3, R—5, S—1

(b) P—3, Q—2, R—4, S—1

(c) P—4, Q—3, R—5, S—2

(d) P—4, Q—1, R—2, S—5

60. Which of the following statements is/are correct?

(a) The unit of Lighting Power Density is W/m^2.

(b) The unit of Lighting Power Density is cd/m^2.

(c) The unit of Sound Power is W.

(d) The unit of Energy Performance Index is $kWh/m^2/year$.

61. Which of the following statements is/are correct?

(a) Kath-kuni construction comprises layers of stone and timber.

(b) Nalukettu houses have a courtyard.

(c) Ikra is a two-storeyed house with stone masonry and a flat-roof.

(d) Bhunga has a circular plan.

62. A 5 m long Aluminium tie rod of cross-section 0.20 m × 0.04 m is subjected to a tensile force induced by its self-weight of 21.20 kg/m considering gravitational acceleration of 10 m/s^2. If tensile Young's modulus of Aluminium is 70,000 MPa, the maximum tensile strain in the rod is _____×10^{-6} (rounded off to two decimal places).
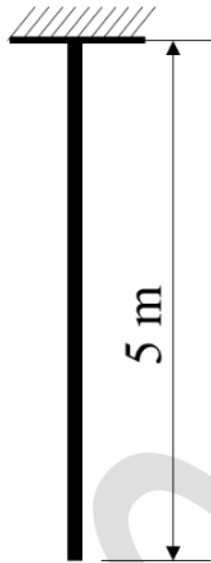
Figure 15: Aluminium Tie Rod

63. The following Figure shows the excavation plan of a two room structure, where the trench has a uniform width of 1.10 meters. If the cumulative centre line length of the trench is 41.10 meters and the required depth of concrete to be poured is 0.30 meters, the volume of concrete in foundation, in cubic meters, will be _____ (rounded off to two decimal places).
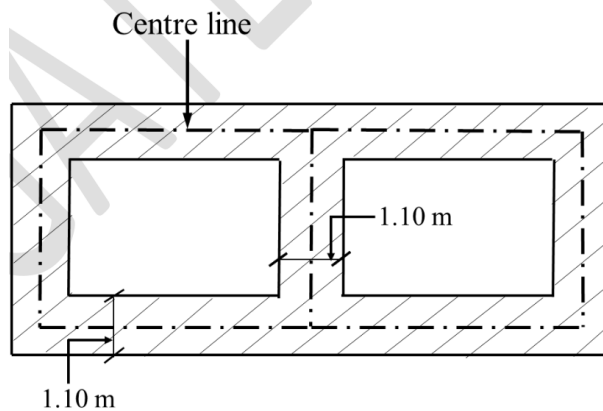
Figure 16: Excavation Plan

64. The decay of sound in an enclosed lecture hall of volume 3500 m^3 is shown in the Figure below. The sound source is switched off at point **P**. Using the Reverberation Time (RT_60) obtained from the figure, the calculated total sound absorption of the hall, in Sabins, is _____ (rounded off to the nearest integer).
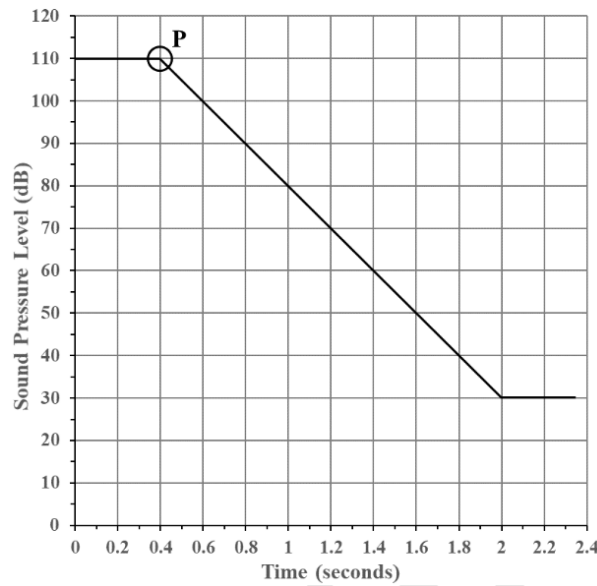(GATE-AR 2024)

Figure 17: Sound Pressure Level vs Time

65. A 2 TR window air-conditioner of Energy Efficiency Ratio (EER) 3.1 is catering to a room of volume 40 m^3. The air-conditioner is operational for 600 hours during summer on cooling mode. The compressor is also operational for the complete duration. The total energy consumption of the air-conditioner during the above mentioned period, in kWh, is _____ (rounded off to nearest integer).
(GATE-AR 2024)

PART B2: FOR Planning CANDIDATES ONLY

66. Which of the following aims is set under the SVAMITVA scheme of the Ministry of Panchayati Raj, Government of India?

    (a) Provide tap water connection to all households in rural areas.

    (b) Provide 'right to work' to the rural people falling Below Poverty Line.

    (c) Establish clear ownership of property in rural inhabited (Abadi) areas, by mapping of land parcels using improvised technology.

    (d) Provide effective and efficient institutional platforms to enable the rural poor to increase their household income by means of sustainable livelihood enhancement.

    (GATE-AR 2024)

67. Mass Rapid Transit System is a

    (a) Fixed Route and Fixed Schedule service.

    (b) Fixed Route and Flexible Schedule service.

    (c) Flexible Route and Fixed Schedule service.

    (d) Flexible Route and Flexible Schedule service.

    (GATE-AR 2024)

68. Which of the following initiatives of the Government of India is also known as the National Master Plan for Multi-modal Connectivity?

(a) PM Gati Shakti   (b) Bharatmala   (c) Parvatmala   (d) Sagarmala

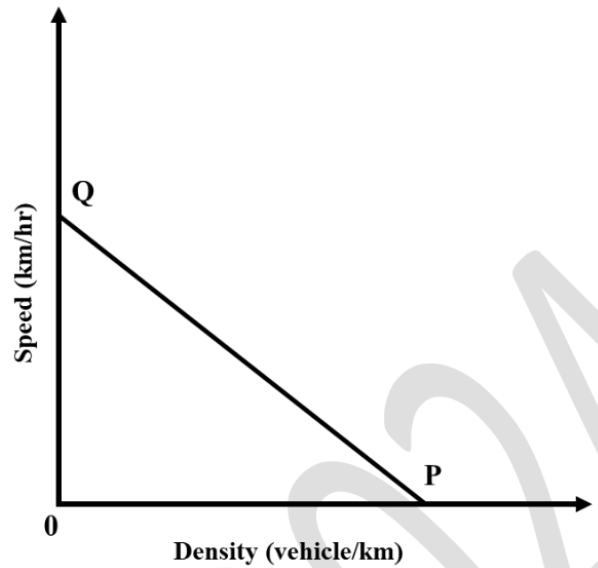69. With reference to the Speed-Density diagram given below, which of the following statements is/are correct?

Figure 18: Speed-Density Graph

(a) Point **P** represents Maximum Flow
(b) Point **P** represents Jam Density
(c) Point **Q** represents Space Mean Speed for Free Flow condition
(d) Point **Q** represents Time Mean Speed

70. Which of the following statements correctly represent(s) the Demographic dividend of a country?

(a) Share of working age population is larger than dependent population.
(b) Share of working age population is lesser than dependent population.
(c) Demographic dividend demands more job creation.
(d) Demographic dividend can never lead to demographic disaster.

71. As per the URDPFI Guidelines 2015, choose the option(s) which indicate(s) the appropriate hierarchy of plans from higher to lower order.

(a) Perspective Plan ¿ Development Plan ¿ Local Area Plan
(b) Development Plan ¿ Special Purpose Plan ¿ Annual Plan
(c) Local Area Plan ¿ Development Plan ¿ Annual Plan
(d) Special Purpose Plan ¿ Perspective Plan ¿ Local Area Plan

72. In 2021, a city survey report revealed a sex ratio of 930 with an estimated increase of 2.16% over the next 20 years. In 2041, the total population of the city is projected to be 15,00,000. The estimated female population in the year 2041 will be _____ (in integer).
(GATE-AR 2024)

73. Match the terms in **Group—I** with their descriptions in **Group—II**.

    Group—I   **Group—II**

    (P) Landfill site   (1) Development on previously developed site

    (Q) Greenfield development   (2) Land to dispose solid waste

    (R) Green Belt   (3) Development on previously undeveloped land

    (S) Brownfield development   (4) Policy to protect livestock

                                      (5) A buffer to control urban development

    (a) P—2, Q—3, R—1, S—4   (c) P—2, Q—3, R—5, S—1

    (b) P—3, Q—5, R—2, S—1   (d) P—3, Q—4, R—5, S—2

74. Match the following illustrations in **Group—I** with their corresponding concepts in **Group—II**.

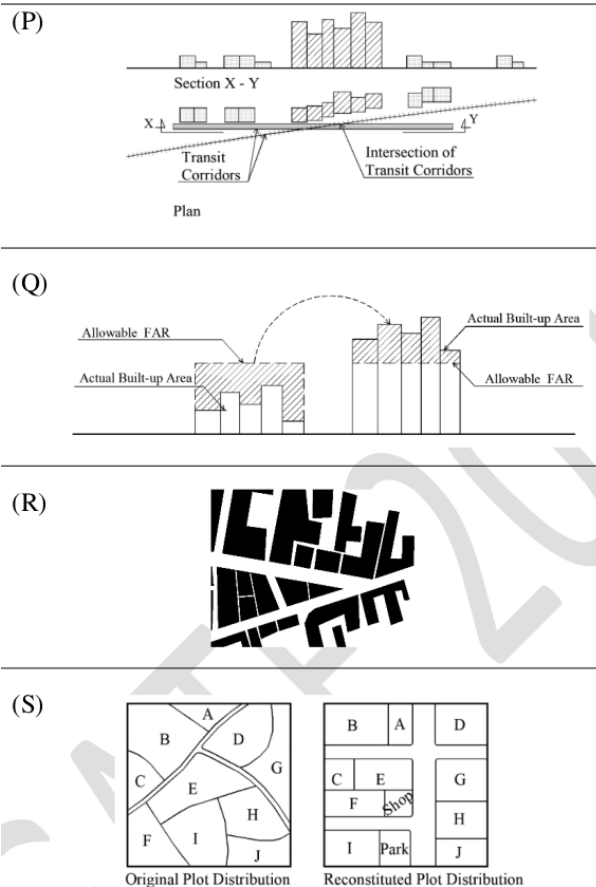   **Group-I**

Figure 19

    Group—II

    (1) Figure Ground Relationship

    (2) Town Planning Scheme (TPS)

    (3) Transit Oriented Development (TOD)

    (4) Transferable Development Rights (TDR)

    (5) Cul-de-Sac

    (a) P—3, Q—4, R—1, S—2   (c) P—1, Q—3, R—4, S—2

    (b) P—3, Q—5, R—2, S—4   (d) P—2, Q—4, R—1, S—5

75. Match the following planning theories/concepts in **Group—I** with their corresponding proponents in **Group—II**.

Group—I	Group—II
(P) Valley Section	(1) McGee and Gemburg
(Q) Third Place Theory	(2) Oscar Newman
(R) Defensible Space	(3) Ray Oldenberg
(S) Desakota Model	(4) Patrick Geddes
	(5) C. A. Doxiadis

(a) P—4, Q—3, R—2, S—1   (c) P—1, Q—3, R—5, S—2

(b) P—4, Q—2, R—3, S—1   (d) P—2, Q—4, R—1, S—5

(GATE-AR 2024)

76. Which of the following methods is/are used in traffic survey to measure the Running Speed and Journey Speed?

(a) Moving Observer Method   (c) Elevated Observer Method

(b) Registration Number Method   (d) Hardy Cross Method

(GATE-AR 2024)

77. In the context of regional planning, which of the following terms represent(s) a region?

(a) Formal   (b) Functional   (c) Isometric   (d) Planning

(GATE-AR 2024)

78. In a one-way single lane traffic stream, the observed average time headway is 2.5 seconds. The traffic flow of the above mentioned lane, in vehicle/hr, is _____ (in integer).
(GATE-AR 2024)

79. The demand of a EcoCity theme park is estimated as $P = 1500 - 7.5Q$, where P (in Indian Rupees) is the price of a ticket for single entry, and Q (in integer) is the number of tickets sold per hour. The maximum revenue per hour along the demand curve, in Indian Rupees, is _____ (in integer).
(GATE-AR 2024)

80. Labour supply and urban growth are represented in X and Y axis of the Figure below. Curve OP represents the relationship between labour supply and urban growth. The ratios A:A' and B:B' are 1:1.2 and 3:1.2, respectively. If 6 units of labour is supplied in B, then the number of units of urban growth in B' will be _____ (rounded off to one decimal place).
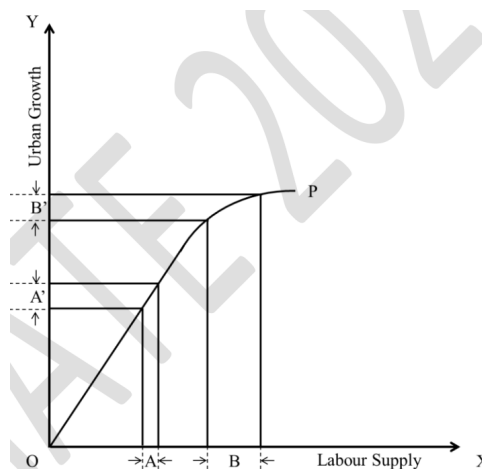
(GATE-AR 2024)

Figure 20: Curve OP

81. A city with a present population of 1,75,000 is expecting an annual population growth rate of 0.85%. In a traffic assessment study, the trip generation model has been developed as $Y = 142 + 0.675X$, where Y is the number of daily trips generated within the city and X is the population of the city. The number of daily trips to be generated within the city after 10 years is _____ (in integer).
(GATE-AR 2024)

END OF THE QUESTION PAPER