

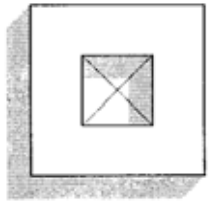



**GATE question papers: Architecture and Planning 2011 (AR)**

	<b>Q. 1 — Q. 25 carry one mark each.</b>
<b>Q.1</b>	Capital town of Gandhinagar has been designed by (A) Norman Foster (B) B.V. Doshi (C) H.K. Mewada (D) Le Corbusier
<b>Q.2</b>	Rajiv Awas Yojana of Ministry of Housing, Government of India addresses housing for (A) Middle Income Group (B) Low Income Group (C) High Income Group (D) Slum Dwellers
<b>Q.3</b>	The triangular space formed by two consecutive arches is (A) Tympanum (B) Spandrel (C) Regula (D) Extrados
<b>Q.4</b>	Rose Window is an iconic feature of (A) Notre Dame, Paris (B) Hagia Sophia, Istanbul (C) St. Peter's, Rome (D) Victoria Memorial, Kolkata
<b>Q.5</b>	Purity of colour is described by (A) Hue (B) Value (C) Chroma (D) Tone
<b>Q.6</b>	A slab simply supported on all its edges with a ratio of longer side to shorter side greater or equal to 2.0 is designed as (A) One way slab (B) Two way slab (C) Flat slab (D) Coffered Slab
<b>Q.7</b>	Entablature consists of (A) Architrave, Tenia, Cornice (B) Architrave, Frieze, Cornice (C) Frieze, Cornice, Triglyphs (D) Cornice, Guttae, Tympanum
<b>Q.8</b>	Town planned for 'Motor Age' refers to (A) Toronto, Ontario (B) Nassan Shores, Long Island (C) Radburn, New Jersey (D) Green Belt, Maryland
<b>Q.9</b>	The minimum road curb length required for parking 10 cars perpendicular to the road is (A) 15 m (B) 25 m (C) 35 m (D) 40 m

<b>Q.10</b>	Which of the following generates heat island? (A) Urban areas (B) Coastal areas (C) Wetlands (D) Forest areas
<b>Q.11</b>	The most suitable earthquake resistant built plan form is (A)  (B)  (C)  (D) 
<b>Q. 12</b>	Transfer of Development Right (TDR) is a tool used for (A) Human development (B) Land development (C) Economic development (D) Infrastructure development
<b>Q. 13</b>	Dandaka form of settlement layout is basically a (A) Grid Iron pattern (B) Ring radial pattern (C) Radial pattern (D) Informal Pattern
<b>Q.14</b>	Maximum horizontal angle from the speaker in a seating area of a lecture theatre should be (A) 70° (B) 90° (C) 120° (D) 140°
<b>Q.15</b>	'U-value' refers to (A) Utility function for convective heat transfer (B) Thermal transmittance of building components (C) Energy transfer between thermal bridges (D) Measure for area related heating and cooling loads

<b>Q. 16</b>	Consistency of cement is measured by (A) Pycometer (B) Slump cone (C) Universal Testing Machine (D) Vicat's apparatus
<b>Q.17</b>	The appropriate material for flooring of an external ramp of a building would be (A) Polished granite (B) Wax polished marble (C) Glazed ceramic tile (D) Rough finish sandstone
<b>Q.18</b>	Which of the following is NOT a member of a Steel Truss? (A) Gusset Plate (B) Wall Plate (C) Fish Plate (D) Anchor Bolts
<b>Q.19</b>	Identify the odd one among the following (A) Security deposit (B) Professional tax (C) Performance bank guarantee (D) Earnest money
<b>Q.20</b>	Weep hole is a term used to describe (A) Perforations in the cast iron pipe used for boring (B) Holes in retaining wall for draining water (C) Holes in the cover plate of floor traps (D) Holes dug in earth to recharge ground water
<b>Q.21</b>	Busway, Busduct and Raceway are components of (A) Security systems (B) Air conditioning systems (C) Electrical systems (D) Water supply systems
<b>Q.22</b>	The difference between Wet Bulb Temperature and Dry Bulb Temperature is called (A) Dry bulb depression (B) Wet bulb depression (C) Variable depression (D) Atmospheric depression
<b>Q.23</b>	In India, one of the Slum Improvement initiatives is (A) Special Residential Zone (B) Valmiki Ambedkar Malin Basti Awas Yojana (C) Indira Awas Yojana (D) Eco Housing
<b>Q.24</b>	Suspended Floors is a structural system used in (A) Lloyds Building, London (B) Jin Mao Building, Shanghai (C) Petronas Tower, Kuala Lumpur (D) Hongkong Shanghai Bank, Hongkong
<b>Q.25</b>	Residual method of valuation is used to determine (A) Public Private Partnership Deal (B) Rent (C) Property Tax (D) Selling Price

	<b>Q. 26 to Q. 55 carry two marks each.</b>			
<b>Q.26</b>	Match the buildings in Group I with their architects in Group II			
	Group I		Group II	
	P.	Bibliotheca Alexandrina, Alexandria	1.	I.M. Pei
	Q.	Institut du Monde Arab, Paris	2.	Jean Nouvel
	R.	Bank of China, Hongkong	3.	Daniel Libeskind
	S.	Jewish Museum, Berlin	4.	Renzo Piano
			5.	Snøhetta
	(A) P-5, Q-2, R-1, S-4 (B) P-5, Q-4, R-1, S-3 (C) P-4, Q-2, R-5, S-3 (D) P-5, Q-2, R-1, S-3			
<b>Q.27</b>	A room measuring 5 m × 3.5 m enclosed by brick wall has a ceiling at 3 m height. The room has a door and a window opening of 1 m × 2 m and 1 m × 1 m respectively. The quantity of plastering required for interior walls (in sqm) is (A) 46.5 (B) 48 (C) 51 (D) 68.5			
<b>Q.28</b>	One cubic metre of Ordinary Portland Cement yields a volume of M15 concrete in the range of (A) 2 to 3 cum (B) 4 to 5 cum (C) 7 to 8 cum (D) 8 to 9 cum			
<b>Q.29</b>	Match the CAD commands in Group I with their functions in Group II.			
	Group I		Group II	
	P.	LAYISO	1.	blends selected object to destination layer
	Q.	LAYMCH	2.	freezes layer of selected object
	R.	LAYMRG	3.	hides or locks layers other than those of selected objects
	S.	LAYLCK	4.	assigns selected object to destination layer
			5.	locks object of destination layer
	(A) P-2, Q-4, R-1, S-5 (B) P-3, Q-2, R-1, S-5 (C) P-4, Q-2, R-3, S-5 (D) P-3, Q-4, R-1, S-5			
<b>Q.30</b>	Match the buildings in Group I with their corresponding structural forms in Group II.			
	Group I		Group II	
	P.	Hall of Nations, New Delhi	1.	Spherical Structure
	Q.	Salvacao Church, Mumbai	2.	Folded Plates
	R.	State Trading Corporation Building, New Delhi	3.	Octahedral lattice structure
	S.	Matrimandir, Auroville	4.	Vierendeel girders
			5.	Shell roof structure
	(A) P-3, Q-5, R-4, S-1 (B) P-2, Q-5, R-4, S-1 (C) P-3, Q-5, R-4, S-2 (D) P-3, Q-5, R-2, S-1			

Q.31	Identify the INCORRECT statement (A) Guggenheim, Bilbao is an example of Deconstructivism (B) Silver Abstraction is a term used for metal clad modern high rise buildings (C) Spiral Building in Tokyo has a curvilinear built form (D) Free Building plan form is a concept given by Le Corbusier																								
Q.32	Match the terms in Group I with their descriptions in Group II. <table><tr><th colspan="2">Group I</th><th colspan="2">Group II</th></tr><tr><td>P.</td><td>Quoin</td><td>1.</td><td>Geometric representation of the universe</td></tr><tr><td>Q.</td><td>Stucco</td><td>2.</td><td>Small dome</td></tr><tr><td>R.</td><td>Mandala</td><td>3.</td><td>Triangular form above an opening</td></tr><tr><td>S.</td><td>Cupola</td><td>4.</td><td>Corner stone at the angle of buildings</td></tr><tr><td></td><td></td><td>5.</td><td>Plaster</td></tr></table> <p>(A) P-4, Q-3, R-2, S-1 (B) P-3, Q-5, R-1, S-4 (C) P-4, Q-5, R-1, S-2 (D) P-3, Q-1, R-5, S-4</p>	Group I		Group II		P.	Quoin	1.	Geometric representation of the universe	Q.	Stucco	2.	Small dome	R.	Mandala	3.	Triangular form above an opening	S.	Cupola	4.	Corner stone at the angle of buildings			5.	Plaster
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Q.34	Gestalt's Laws of visual perception DO NOT relate to (A) Aesthetics of form are a function of Golden Section (B) Things are perceived as a whole (C) Whole is greater than the sum total of its parts (D) Elements with continuity are perceived together																								
Q.35	A site in a map drawn to scale of 1:16000 measures 75 sqcm. The actual area of the site in hectares is (A) 120 (B) 162 (C) 192 (D) 256																								
Q.36	Identify the CORRECT CAD statements. P. SPLINE connects sequence of line segments into a single object Q. SPLINE is a smooth curve passing through or near a given set of points R. PLINE creates straight line segments, arc segments or both S. PLINE can be closed only when its start and end points are coincident and tangent T. PLINE allows adjusting the width and curvature of its multiline segments U. SPLINE can be exploded into smaller segments V. PLINE can be converted into a continuous curve segment (A) P, R, S, U (B) Q, R, T, V (C) R, S, T, V (D) S, T, U, V																								

**Q.37** Match the eminent personalities in Group I with their books and statements in Group II.

Group I		Group II	
P.	Kevin Lynch	1.	The Fountainhead
Q.	Ayn Rand	2.	Small is Beautiful
R.	Paul D. Spreiregen	3.	Site Planning
S.	E. F. Schumacher	4.	Urban Design : Architecture of Towns and Cities
		5.	Design of Cities

(A) P-4, Q-2, R-5, S-3

(B) P-3, Q-1, R-2, S-5

(C) P-5, Q-1, R-4, S-2

(D) P-3, Q-1, R-4, S-2

**Q.38** Match the urban forms listed in Group I with the towns listed in Group II.

Group I		Group II	
P.	Grid Iron	1.	New Delhi
Q.	Radial	2.	Washington D.C.
R.	Linear	3.	Copenhagen
S.	Finger plan	4.	Mumbai
		5.	Canberra

(A) P-2, Q-1, R-4, S-3

(B) P-3, Q-1, R-2, S-5

(C) P-3, Q-1, R-4, S-2

(D) P-2, Q-1, R-4, S-5

**Q.39** Consider the following features:

1. Length finely proportional to its width
  2. Statues as silhouettes against the sky above cornice lines
  3. Fountains signifying fine vintage points
  4. Series of different shapes connected by traditional narrow streets, column screens or arches
- The element of urban design which comprises the above is

(A) Vista

(B) Piazza

(C) Rond Point

(D) Bosque

**Q.40** Match the instruments in Group I with their corresponding functions in Group II.

Group I		Group II	
P.	Hygrometer	1.	Precipitation
Q.	Disdrometer	2.	Vapor Pressure
R.	Anemometer	3.	Solar Radiation
S.	Manometer	4.	Relative Humidity
		5.	Velocity of Air

(A) P-4, Q-1, R-2, S-3

(B) P-4, Q-3, R-2, S-5

(C) P-1, Q-2, R-5, S-4

(D) P-4, Q-1, R-5, S-2

**Q.41**

Match the features in Group I with the corresponding type of garden in Group II.

Group I		Group II	
P.	Symmetrical layout, water cascades, entombment	1.	French gardens
Q.	Radial layout, symmetrical sculpture, boulevards	2.	English gardens
R.	Occult Symmetry, pontoon bridges, stepping stones	3.	Chinese gardens
S.	Hierarchy of courts, hierarchy of gates, zoomorphic forms	4.	Mughal gardens
		5.	Japanese gardens

(A) P-2, Q-1, R-4, S-3

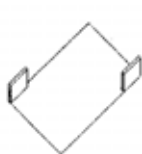
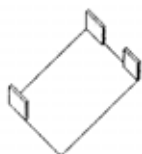
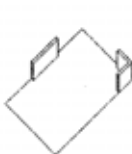
(B) P-4, Q-1, R-5, S-3

(C) P-4, Q-3, R-5, S-1

(D) P-5, Q-1, R-2, S-3

**Q.42**

Arrange the following sense of enclosures in a hierarchy of decreasing order

**P****Q****R****S****T****U**(A)  $S > Q > U > P > T > R$ (B)  $U > S > Q > R > P > T$ (C)  $P > Q > R > S > T > U$ (D)  $T > P > S > Q > U > R$ **Q.43**

Match the elements of Group I with their corresponding type in Group II.

Group I		Group II	
P.	Fire hydrant	1.	Street Furniture
Q.	Planter beds	2.	Street Hardware
R.	Letter box		
S.	Traffic signs		
T.	Lamp Posts		

(A) P-2, Q-1, R-1, S-2, T-2

(B) P-1, Q-1, R-2, S-1, T-1

(C) P-1, Q-1, R-2, S-2, T-2

(D) P-2, Q-1, R-2, S-2, T-2

**Q.44**

In a construction project schedule, A is the first activity. Activities B and C follow A. Activity D follows B and C. Activity E follows C. Activity F follows D and E.

Activity	A	B	C	D	E	F
Duration(in days)	3	2	5	6	5	3









The critical time to complete the project will be

(A) 14 days

(B) 16 days

(C) 17 days

(D) 20 days

Q.45	<p>The maintenance cost of a building will be Rs. 2 lacs after 10 years. The annual sinking fund required for such maintenance @ 6 % interest per annum will be</p> <p>(A) Rs. 17,200/-          (B) Rs. 15,200/-          (C) Rs. 13,200/-          (D) Rs. 11,200/-</p>
Q.46	<p>Match the figures in Group I with the fixtures in Group II.</p> <p><b>Group I</b></p> <div style="display: flex; justify-content: space-around; align-items: center;">     </div> <p style="text-align: center;">P                      Q                      R                      S</p> <p><b>Group II</b></p> <p>1. Sink Cock          2. Bib Cock          3. Pillar Cock          4. Stop Cock</p> <p>(A) P-1, Q-4, R-2, S-3          (B) P-2, Q-3, R-1, S-4          (C) P-3, Q-1, R-2, S-4          (D) P-2, Q-4, R-3, S-1</p>
Q.47	<p>Match the joints in Group I with the corresponding figures in Group II.</p> <p><b>Group I</b></p> <p>P. Butt joint          Q. Rebated joint          R. Table joint          S. Tongue &amp; Groove joint</p> <p><b>Group II</b></p> <div style="display: flex; justify-content: space-around; align-items: center;">     </div> <p style="text-align: center;">1.                      2.                      3.                      4.</p> <p>(A) P-3, Q-4, R-1, S-2          (B) P-4, Q-1, R-3, S-2          (C) P-3, Q-1, R-2, S-4          (D) P-3, Q-4, R-2, S-1</p>
	<p><b>Common Data Questions</b></p>
	<p><b>Common Data for Questions 48 and 49:</b></p> <p>A beam of span L is simply supported at two ends. One half span of the beam weighs W and the remaining half span weighs 2W.</p>
Q.48	<p>Maximum shear force in the beam will be</p> <p>(A) W          (B) 1.25W          (C) 1.75W          (D) 3W</p>
Q.49	<p>Maximum bending moment will occur at</p> <p>(A) L/16 from midpoint of the beam          (B) Midpoint of the beam          (C) L/7 from midpoint of the beam          (D) One of the endpoints of the beam</p>



	<b>Common Data for Questions 50 and 51:</b> A building site has a plot of 500 sqm Maximum allowable height — G+7 Area to be utilized for paved access roads — 10 % Maximum ground coverage — 40% Runoff coefficient for paved surface — 0.9 Maximum allowable FAR — 2.0 Runoff coefficient for unpaved surface — 0.3								
<b>Q.50</b>	If maximum allowable FAR is utilized, the minimum ground coverage would be (A) 20 % (B) 25 % (C) 30 % (D) 35 %								
<b>Q.51</b>	If it rains for 30 min. with an intensity of 10 cm/hr, minimum volume of rain water that can be collected will be (A) 12.75 cum (B) 14 cum (C) 15 cum (D) 16 cum								
	<b>Linked Answer Questions</b>								
	<b>Statement for Linked Answer Questions 52 and 53:</b> An auditorium having volume of 4500 cum and total absorption of all acoustic materials is 480 m <sup>2</sup> sabine								
<b>Q.52</b>	The reverberation time of the auditorium is (A) 1.0 second (B) 1.5 second (C) 2.0 second (D) 2.5 second								
<b>Q.53</b>	To reduce reverberation time by 0.5 second, additional absorption (m <sup>2</sup> sabine) required would be (A) 120 (B) 160 (C) 240 (D) 720								
	<b>Statement for Linked Answer Questions 54 and 55:</b> A residential sector planned over an area of 100 hectares has been divided into various plots, each having one dwelling unit with an average household size of 5 persons. Remaining area is devoted for schools, roads, parks, shops etc. <table border="1" data-bbox="288 1536 571 1713"> <thead> <tr> <th>Plot size</th><th>Number</th></tr> </thead> <tbody> <tr> <td>500 sqm</td><td>500</td></tr> <tr> <td>300 sqm</td><td>500</td></tr> <tr> <td>200 sqm</td><td>1000</td></tr> </tbody> </table>	Plot size	Number	500 sqm	500	300 sqm	500	200 sqm	1000
Plot size	Number								
500 sqm	500								
300 sqm	500								
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<b>Q.54</b>	The gross density of the residential sector in persons per hectare would be (A) 100 (B) 150 (C) 200 (D) 250								
<b>Q.55</b>	Assuming 20% of the total population being higher secondary school going children and expected enrolment being 80% with per capita floor space requirement of 5.0 sqm, then minimum land required for school building with 40% ground coverage and FAR 0.5 would be (A) 1.0 hectares (B) 1.6 hectares (C) 2.2 hectares (D) 2.8 hectares								

	General Aptitude (GA) Questions
	<b>Q. 56 - Q. 60 carry one mark each.</b>
<b>Q.56</b>	Choose the word from the options given below that is most nearly opposite in meaning to the given word: <b>Amalgamate</b> (A) merge (B) split (C) collect (D) separate
<b>Q.57</b>	Choose the most appropriate word from the options given below to complete the following sentence. <b>If you are trying to make a strong impression on your audience, you cannot do so by being understated, tentative or _____.</b> (A) hyperbolic (B) restrained (C) argumentative (D) indifferent
<b>Q.58</b>	Choose the most appropriate word(s) from the options given below to complete the following sentence. <b>I contemplated _____ Singapore for my vacation but decided against it.</b> (A) to visit (B) having to visit (C) visiting (D) for a visit
<b>Q.59</b>	If $\log(P) = (1/2) \log(Q) = (1/3) \log(R)$ , then which of the following options is TRUE? (A) $P^2 = Q^3 R^2$ (B) $Q^2 = PR$ (C) $Q^2 = R^3 P$ (D) $R = P^2 Q^2$
<b>Q.60</b>	Which of the following options is the closest in the meaning to the word below: <b>Inexplicable</b> (A) Incomprehensible (B) Indelible (C) Inextricable (D) Infallible
	<b>Q. 61 to Q. 65 carry two marks each.</b>
<b>Q.61</b>	A container originally contains 10 litres of pure spirit. From this container 1 litre of spirit is replaced with 1 litre of water. Subsequently, 1 litre of the mixture is again replaced with 1 litre of water and this process is repeated one more time. How much spirit is now left in the container? (A) 7.58 litres (B) 7.84 litres (C) 7 litres (D) 7.29 litres
<b>Q.62</b>	A transporter receives the same number of orders each day. Currently, he has some pending orders (backlog) to be shipped. If he uses 7 trucks, then at the end of the 4th day he can clear all the orders. Alternatively, if he uses only 3 trucks, then all the orders are cleared at the end of the 10th day. What is the minimum number of trucks required so that there will be no pending order at the end of the 5th day? (A) 4 (B) 5 (C) 6 (D) 7

Q.63	<p>The variable cost (V) of manufacturing a product varies according to the equation <math>V = 4q</math>, where q is the quantity produced. The fixed cost (F) of production of same product reduces with q according to the equation <math>F = 100/q</math>. How many units should be produced to minimize the total cost (V+F)?</p> <p>(A) 5 (B) 4 (C) 7 (D) 6</p>																				
Q.64	<p>P, Q, R and S are four types of dangerous microbes recently found in a human habitat. The area of each circle with its diameter printed in brackets represents the growth of a single microbe surviving human immunity system within 24 hours of entering the body. The danger to human beings varies proportionately with the toxicity, potency and growth attributed to a microbe shown in the figure below:</p> <div><table><thead><tr><th>Microbe</th><th>Potency (x)</th><th>Toxicity (y)</th><th>Diameter (mm)</th></tr></thead><tbody><tr><td>P</td><td>0.4</td><td>800</td><td>50</td></tr><tr><td>Q</td><td>0.5</td><td>600</td><td>40</td></tr><tr><td>R</td><td>0.4</td><td>300</td><td>30</td></tr><tr><td>S</td><td>0.8</td><td>200</td><td>20</td></tr></tbody></table></div> <p>A pharmaceutical company is contemplating the development of a vaccine against the most dangerous microbe. Which microbe should the company target in its first attempt?</p> <p>(A) P (B) Q (C) R (D) S</p>	Microbe	Potency (x)	Toxicity (y)	Diameter (mm)	P	0.4	800	50	Q	0.5	600	40	R	0.4	300	30	S	0.8	200	20
Microbe	Potency (x)	Toxicity (y)	Diameter (mm)																		
P	0.4	800	50																		
Q	0.5	600	40																		
R	0.4	300	30																		
S	0.8	200	20																		
Q.65	<p><b>Few school curricula include a unit on how to deal with bereavement and grief, and yet all students at some point in their lives suffer from losses through death and parting.</b></p> <p>Based on the above passage which topic would not be included in a unit on bereavement'?</p> <p>(A) how to write a letter of condolence (B) what emotional stages are passed through in the healing process (C) what the leading causes of death are (D) how to give support to a grieving friend</p>																				
END OF QUESTION PAPER																					