gate 1

AI25btech11027 - Bhuvana

2007
AR: Architecture and Planning

Duration:Three hours Maximum Marks:150

I. Read the following instuctions carefully.

1) This question paper contains 85 objective type questions.Q.1-Q.20 carry one mark each and Q.21-Q.85 carry two marks each
2) Attempt all the Questions.
3) Questions must be answered on Objective Response sheet (*ORS*) by darkening the appropriate bubble (*markedA*, *B*, *C*, *D*) using HB pencil against the question number on the left hand side of ORS. **Each question has only one correct answer.**In case you wish to change the answer,erase the old answercompletely.
4) Wrong answers will carry NEGATIVE marks.In Q.1 to Q.20,**0.25** mark will be deducted for each wrong answer.In Q.21 to Q.76,Q.78,Q.80,Q.82 and in Q.84, **0.5** However,there is no negative marking in Q.77,Q.79,Q.81,Q.83 and in Q.85.More than one answer bubbled against a question will be taken as an incorrect response.Unattempted questions will not carry any marks.
5) Write your registration number,your name and name of the examination centre at the specified locations on the right half of the **ORS**
6) Using HB pencil,darken the appropriate bubble under each digit of your registration number and the letters corresponding to your paper code.
7) Calculator is allowed in the examination hall
8) Charts,graph sheets or tables are NOT allowed in the examination hall.
9) Rough work can be done on the question paper itself.Additionally blank pages are given at the end of the Question paper for rough work.
10) The question paper contains **20** printed pages including pges for rough work.Please check all pages and report,if there is any discrepancy.

Q.1-Q.20 carry one mark each

1) **Ramsar** list is related to **(GATE EE 2025)**
   a) high rise apartments
   b) low rise detached dwellings
   c) organic architecture
   d) prefabricated housing
2) Hazen's-William's nomogram is used to calculate **(GATE EE 2025)**
   a) size of sanitary pipe lines
   b) size of water supply pipe lines
   c) capacity of overhead water resevoir
   d) capacity of water required for fire fighting
3) A **woonerrf** is a **(GATE EE 2025)**

a) Pavement pattern
b) sanitation system element
c) speed reducing element
d) furniture detail

4) In urban planning,**cohort** refers to **(GATE EE 2025)**
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 **(GATE EE 2025)**
a) high rise apartment
b) low rise detached dwellings
c) organic architecture
d) prefabricated housing

6) The degree of freedom of a joint in a plane truss is **(GATE EE 2025)**

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 full brick is called **(GATE EE 2025)**

a) King closer b) Frog c) Quoin brick d) Queen closer

8) The strength of concrete increases with **(GATE EE 2025)**
a) increase in water cement ratio
b) decrease in water cement ratio
c) increase of work ability
d) decrease in cement aggregate ratio

9) The point of contraflexure is the point where the **(GATE EE 2025)**

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 permissibe stresses in the material are increased by **(GATE EE 2025)**

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 habits maintaining an extremely high population density is **(GATE EE 2025)**

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 **(GATE EE 2025)**

a) Fissure b) Fault c) Eluvium d) Drift

13) **LEED** is the internationally accepted rating system for **(GATE EE2025)**

a) Green buildings
b) Fire resistant buildings
c) Intelligent buildings
d) Tall buildings

14) An architect of the **Chicago School** movement is **(GATE EE 2025)**

a) Richard Boyle
b) Louis Sullivan
c) Hector Guimard
d) William Moris

15) **Surkhi** is obtained by grinding **(GATE EE 2025)**

a) well burnt clay bricks
b) slag from industry
c) stone aggregate
d) rice husk

16) **Hemadpanthi** style of temples belongs to **(GATE EE 2025)**

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 **(GATE EE 2025)**

a) Hagia Sophia
b) Pantheon
c) Parthenon
d) Gol Gumbaz

18) National Science Centre at Pragati Maidan,New Delhi is designed by **(GATE EE 2025)**

a) J.A.Stein b) Anant Raje c) Raj Rewal d) A.P.Kavinde

19) In Islamic architecture,the device used for placing a perfect circular dome over a square plan is called a **(GATE EE 2025)**

a) Mehrab b) Scroll c) Mastaba d) Squinch

20) Parallel sound rays incident on a convex surface of a fibre-board will **(GATE EE 2025)**

a) converge and reduce in intensity
b) converge 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 **(GATE EE 2025)**

Group I	Group II
P. Hippodamus	1. City Beautiful
Q. Michelangelo	2. Star-shaped plan
R. Leon Battisa 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 **(GATE EE 2025)**

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

a) P,Q,R,S
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 **(GATE EE 2025)**

Group I	Group II
P. Khajuraho	1. Star-shaped Garbhagriha
Q. Dravidian	2. Gopuram
R. Hoysala	3. Pyramidal Roof
S. Himalayan	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 meters. If the distance between the midpoints of the highest and lowest contours is 700 meters,then the contour interval in meters is **(GATE EE 2025)**

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 temparature diference between indoor and outdoor air	2. False
R. Venturi effect is a passiive cooling technique	
S. Wind breaks are used to maximize winter wind turbulence	

(GATE EE 2025)

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-1,Q-1,R-1,S-1

26) A person standing at a point in a public plaza is observing's facade of height 40 meters from a distance of 120 meters. The sense of enclosure experienced by the person is equivalent to limits of **(GATE EE 2025)**

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.

P. Sector Theory	1. Walter Christaller
Q. Multiple Nuclei Theory	2. Clarence Perry
R. Neighbourhood Theory	3. Ebenezer Howard
S. Cental Place Theory	4. Harris & ullman
	5. Homer Hoyt

(GATE EE 2025)

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 plots has an urban fabric with **(GATE EE 2025)**

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. **(GATE EE 2025)**

Group I	Group II
P. Elev	1. Changes the dashed line to a non-dashed line
Q. LType	2. Changes the size and spacing of the dashes
R. Thickness	3. Changes the position along on the screen
S. Ltscale	4. Changes the width of the line on the screen
	5. Changes the height along 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. **(GATE EE 2025)**

P. All intelligent buildings are examples of high-tech architecture	1. True
Q. An intelligent buildings is synonymous with a smart building	2. False
R. An intellingent 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 muncipal water main is **(GATE EE 2025)**

a) stopcork $\longrightarrow$ water meter $\longrightarrow$ Goose neck $\longrightarrow$ $Servicepipe$ $\longrightarrow$ Ferrule connection
b) Ferrule connection $\longrightarrow$ $stopcock$ $\longrightarrow$ $Gooseneck$ $\longrightarrow$ $servicepipe$ $\longrightarrow$ $Waterpipe$
c) Goose neck $\longrightarrow$ $Ferruleconnection$ $\longrightarrow$ $Servicepipe$ $\longrightarrow$ $Watermeter$ $\longrightarrow$ $stopcock$
d) Ferrule connection $\longrightarrow$ $Gooseneck$ $\longrightarrow$ $Servicepipe$ $\longrightarrow$ $Stopcock$ $\longrightarrow$ $Watermeter$

32) The figure that will be generated by the following sequence of commands in AutoCAD is **(GATE EE 2025)**

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

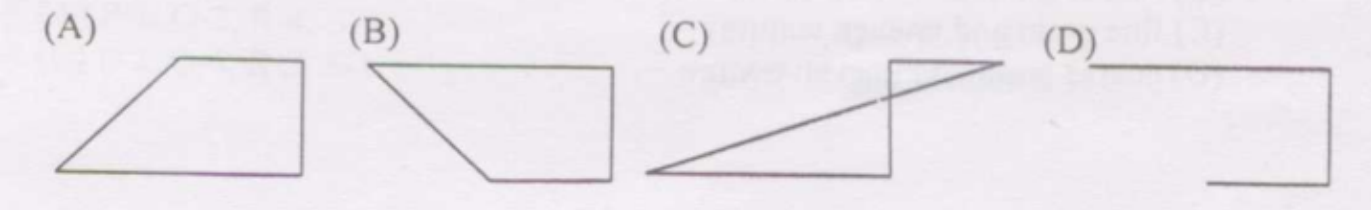

Fig. 32.

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 **(GATE EE 2025)**

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. **(GATE EE 2025)**

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 all traps
R. single stack system	3. Minimum two pipes,one for soil and sullage and 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 determinacy and stability ,where **m** = number of members and **f** = number of joints. The truss is deficient and unstable when **(GATE EE 2025)**

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 given figure of Concentric Zone Theory by Burgress. **(GATE EE 2025)**

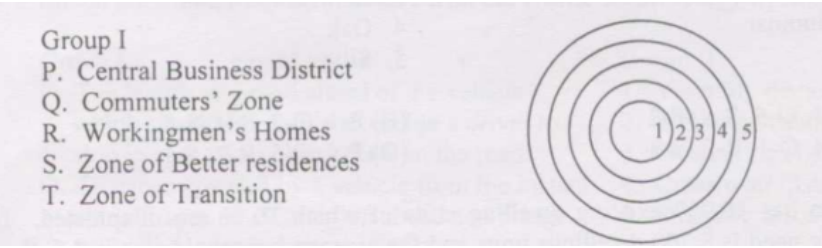

Fig. 36.

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 **(GATE EE 2025)**

a) 9 b) 6 c) 4 d) 3

38) Zoning regulations deal with **(GATE EE 2025)**

P. Density
Q. Land use
R. Building materials
S. Minimum areas of rooms
T. Height
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. **(GATE EE 2025)**

Group I	Group II
P. Konark	1. Golden lily Pond
Q. Madhurai	2. Sculptured Marble Ceiling
R. Dilwara	3. Twin Vimanas
S. Mamallapuram	4. Chariot
	5. Torana

a) P-3,Q-1,R-2,Q-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 **(GATE EE 2025)**

a) Architrave ⟶ Frieze ⟶ Capital ⟶ Cornice ⟶ Shaft ⟶ Pedestal ⟶ Base
b) Architrave ⟶ Capital ⟶ Cornice ⟶ Frieze ⟶ Base ⟶ Shaft ⟶ Pedestal
c) Cornice ⟶ Frieze ⟶ Architrave ⟶ Capital ⟶ Shaft ⟶ Base ⟶ Pedestral
d) Cornice ⟶ Capital ⟶ Frieze ⟶ Architrave ⟶ Shaft ⟶ Pedestral ⟶ Base

41) Match the **tree forms** in Group I with their **common examples** in Group II. **(GATE EE 2025)**

Group I	Group II
P. Broad	1. False Acacia
Q. Tapering	2. Holly
R. Conical	3. Lombardy Poplar
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-2,Q-3,R-4,S-1
d) P-3,Q-4,R-1,S-2

42) A town has $16,000$ existing dwellings 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 **(GATE EE 2025)**

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 **Orientation** in Group II. **(GATE EE 2025)**

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 yeilding an impression in relief	2. Emboss
R. Delicate or intricate design on lattice work allowing light through oenings	3. Filigree
S. Artistic composition consisting of motifs borrowed from different sources	4. Fresco
	5. Intaglio
	6. Pastiche

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

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-4,S-3

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 **(GATE EE 2025)**

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. **(GATE EE 2025)**

P. The length of a r oad 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 panelled door in Group I with their **names** in Group II. **(GATE EE 2025)**

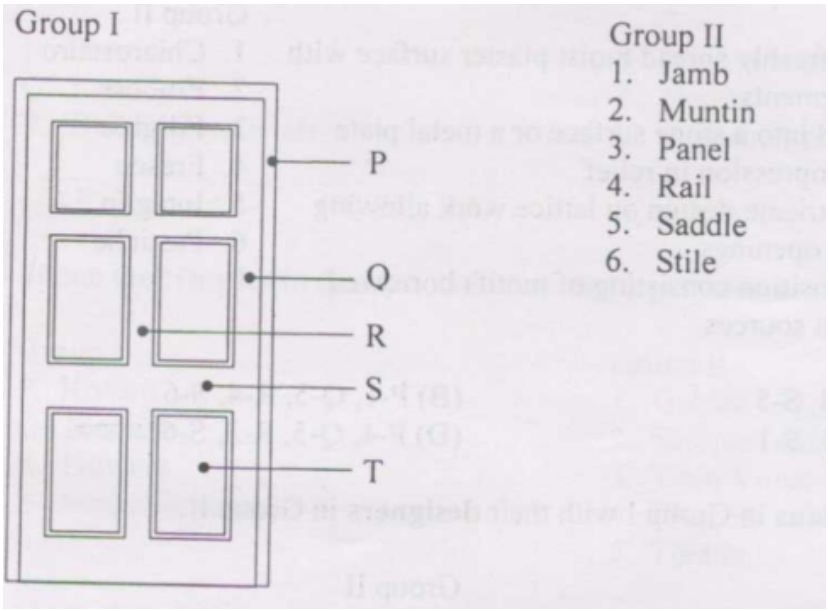

Fig. 47.

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 buiding is 50 years,at the end of which it will have a 15% scrap value of its cost of constuction.Its present value in Rupees is **(GATE EE 2025)**

a) $36,000$ b) $66,000$ c) $75,000$ d) $85,000$

49) A typical roof top **Rainwater Harvesting System** essentially comprises of **(GATE EE 2025)**
P. Roof catchment
Q. Down pipes
R. Rain guage
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. **(GATE EE 2025)**

Group I	Group II
P. Norman Foster	1. Petronas 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 *meters* $\times$ 5 *meters* meters enclosed by 20 cm thick walls has to be constructed.The required foundation trench is 80 cm wide and 80 cm deep. The quantity of earthwork in excavation in cubic meters is **(GATE EE 2025)**

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. **(GATE EE 2025)**

Group I	Group II
P. Heartwood	1. Outer annual rings of the tree
Q. Sapwood	2. Thin horizontal veins radiating from the pith towards the bark
R. Cambium Layer	3. Outermost protective covering of the log
S. Medullary Rays	4. Innermost rings surroundings the pith
	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 $m \times 0.3$ $m \times 3.0$ m $(L \times B \times H)$ with a window opening $2.0m \times 0.30m \times 1.2m$ is **(GATE EE 2025)**

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 Groups II.**(GATE EE 2025)**

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 volume 15.0 cu.m. is @ 1% then the quality of steel required in kilogram is **(GATE EE 2025)**

a) 655.5 b) $1,000.0$ c) $1,177.5$ d) $1,500$

56) The **Prairie House** design of Frank Lloyd Wright is characterised by **(GATE EE 2025)**
P. Horizontal planes
Q. Extended roofs
R. Focal fire place
S. Steel coloumns
T. Vertical 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. **(GATE EE 2025)**

Group I	Group II
P. Bay window	1. Horizontal louvers pivoting simultaneously in a 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. Dorner 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 meters. It carries two loads of 50 kN each at one-third span. The section modulus (in cubic cm) of the beam at the quarter span is **(GATE EE 2025)**

a) 11.17
b) 12.27
c) 13.37
d) 14.47

60) Match the **Earthqake related terms** in Group I with their **definitions** in Group II. **(GATE EE 2025)**

Group I	Group II
P. Focus	1. The geographical point on the earth's surface vertically above the originating source
Q. Epicentre	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. **(GATE EE 2025)**

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 distributions of total energy emission is **(GATE EE 2025)**

a) 5% light & 95% heat
b) 25% light & 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. **(GATE EE 2025)**

Group I	Group II
P. High humidity accelerates rusting and rotting	1. Composite or monsoon
Q. High daytime temparature 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 **(GATE EE 2025)**

P. Aurora House by Aldo Rossi
Q. Schroder House by Gerrit Reitveid
R. Thematic House by Jencks & Farrell
S. Tugendhat House by Mies vander 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 **(GATE EE 2025)**

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. **(GATE EE 2025)**

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 perpendicular intersection of two vaults	3. Conical
S. Compound vault formed by four coves meeting along diagonal vertical planes	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 meters is **(GATE EE 2025)**

a) 1.00 b) 1.15 c) 1.20 d) 1.30

68) Match the statements about **elevators & esclators** in Group I with **True/False** in Group II. **(GATE EE 2025)**

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 $3,000$ mm	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 **(GATE EE 2025)**

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. **(GATE EE 2025)**

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	**Duration(days)**		**Immediate Predecessors**
	Normal	crash	
P	3	3	-
Q	4	4	P
R	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 **(GATE EE 2025)**

a) 11 b) 12 c) 13 d) 14

72) For the all normal soltion, the total float and free float for the activity S are **(GATE EE 2025)**

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 **(GATE EE 2025)**

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 electrical 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 **(GATE EE 2025)**

a) $12,000$ b) $16,666$ c) $30,000$ d) $33,333$

75) The depreciation factor for the above lamp is **(GATE EE 2025)**

a) 0.6 b) 1.25 c) 1.33 d) 1.66

Linked Answer Question: 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 = $\frac{1}{3}^{\text{rd}}$ of specific tank capacity

76) Total capacity of septic tank in cubic metres is **(GATE EE 2025)**

a) 31.70 b) 23.40 c) 20.80 d) 15.60

77) De-sludging interval (to the nearest year) is **(GATE EE 2025)**

a) 1 b) 2 c) 3 d) 4

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

78) Maximum total buildable area in sq.m is **(GATE EE 2025)**

a) 180 b) 225 c) 360 d) 450

79) As per revised buiding 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 **(GATE EE 2025)**

a) increases by 248sq.m
b) increases by 40sq.m
c) decreases by 30sq.m
d) decreases by 40sq.m

Statement for Linked Answer Questions 80 & 81:
An aeriel photograph is taken from a plane with a camera lens of focal length 305 mm. The desired

scale of photograph is $1:25,000$ and the height of the terrian above mean sea level is 300 metres.

80) The flying height of the plane above mean sea level is **(GATE EE 2025)**

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 **(GATE EE 2025)**

a) $1:45,000$ b) $1:37,740$ c) $1:36,310$ d) $1:19,050$

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

82) The maximum values of shear force and bending moment in the beam are **(GATE EE 2025)**

a) 5kN , 50kN-m
b) 20kN , 80kN-m
c) 15kN , 45kN-m
d) 10kN , 50kN-m

83) The maximum values of bending stress and shear stress developed in the beam in N/mm^2 are **(GATE EE 2025)**

a) 5.15 , 0.1 b) 6.25 ,0.125 c) 7.35 ,0.15 d) 8.45 , 0.175

Statements 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 **(GATE EE 2025)**

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 **(GATE EE 2025)**

a) 0.4 b) 0.6 c) 0.8 d) 1.2

END OF THE QUESTION PAPER