Architecture and Planning

AI25btech11027 - Bhuvana

Q1 to Q5 carry 1 mark each & Q6 to Q10 carry 2 marks each

1) Choose the most appropriate word from the options given below to complete the following sentence:
The principal presented the chief guest with a _____, as token of appreciation. **(GATE EE 2025)**

a) Momento b) Memento c) Momentum d) Moment

2) Choose the appropriate word/phrase, out of the four options given below, to complete the following sentence:
Frogs _____. **(GATE EE 2025)**

a) Croak b) Roar c) Hiss d) Patter

3) Choose the word most similar in meaning to the given word:
Educe **(GATE EE 2025)**

a) Exert b) Educate c) Extract d) Extend

4) Operators $\square$, $\diamond$ and $\rightarrow$ are defined by: **(GATE EE 2025)**

$$a\square b = \frac{a-b}{a+b}, \quad a\diamond b = \frac{a+b}{a-b}, \quad a \rightarrow b = ab \tag{1}$$

Find the value of $(66\square 6) - (66\diamond 6)$. **(GATE EE 2025)**

a) -2 b) -1 c) 1 d) 2

5) If $\log_x\left(\frac{5}{7}\right) = -\frac{1}{3}$, then the value of x is **(GATE EE 2025)**

a) $\frac{343}{125}$ b) $\frac{125}{343}$ c) $-\frac{25}{49}$ d) $-\frac{49}{25}$

6) The following question presents a sentence, part of which is underlined. Beneath the sentence you will find four ways of phrasing the underlined part. Following the requirements of the standard written English, select the answer that produces the most effective sentence.

Tuberculosis, together with its effects, ranks one of the leading causes of death in India. **(GATE EE 2025)**

a) ranks as one of the leading causes of death
b) rank as one of the leading causes of death
c) has the rank of one of the leading causes of death
d) are one of the leading causes of death

7) Read the following paragraph and choose the correct statement.
Climate change has reduced human security and threatened human well being. As an integral relation of human progress is that human security largely depends upon environmental security. But on the contrary, human progress seems contradictory to environmental security. To keep up both at the

required level is a challenge to be addressed by one and all. One of the ways to curb the climate change may be suitable scientific innovations, while the other may be the Gandhian perspective of small scale progress with focus on sustainability. **(GATE EE 2025)**

a) Human progress and security are positively associated with environmental security.
b) Human progress is contradictory to environmental security.
c) Human security is contradictory to environmental security.
d) Human progress depends upon environmental security.

8) Fill in the missing value. **(GATE EE 2025)**

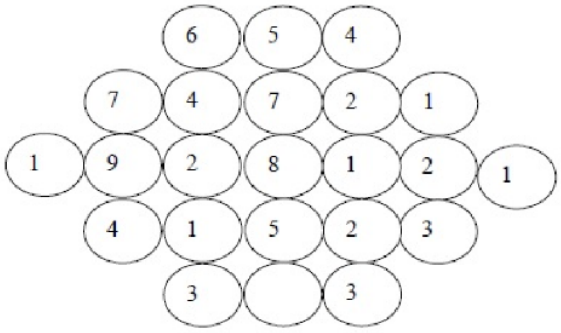

Fig. 8.

9) A cube of side 3 units is formed using a set of smaller cubes of side 1 unit. Find the proportion of the number of faces of the smaller cubes visible to those which are NOT visible.**(GATE EE 2025)**

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

10) Humpty Dumpty sits on a wall every day while having lunch. The wall sometimes breaks. A person sitting on the wall falls if the wall breaks.
Which one of the statements below is logically valid and can be inferred from the above sentences? **(GATE EE 2025)**

a) Humpty Dumpty always falls while having lunch
b) Humpty Dumpty does not fall sometimes while having lunch
c) Humpty Dumpty never falls during dinner
d) When Humpty Dumpty does not sit on the wall, the wall does not break

Q11 to Q35 carry 1 mark each & Q36 to Q65 carry 2 marks each

11) A Housing Finance Institution in the private sector is **(GATE EE 2025)**

a) HUDCO b) SBI c) PNB d) HDFC

12) Which of the following statements regarding PERT is **NOT** true? **(GATE EE 2025)**

a) Each activity of PERT network has three different time estimates
b) Expected activity time is estimated based on β-distribution
c) PERT is a deterministic model
d) PERT network may have more than one critical path

13) Damage of foundation due to “Soil Liquefaction” is related to **(GATE EE 2025)**

a) Cyclones b) Landslides c) Floods d) Earthquakes

14) Walls with high thermal inertia are suitable in which type of climate? **(GATE EE 2025)**

a) Hot-dry b) Hot-humid c) Temperate d) Cold

15) The ratio of town area to agricultural land area as suggested by Sir Ebenezer Howard in "Garden City" concept is **(GATE EE 2025)**

a) 1 : 20 b) 1 : 15 c) 1 : 10 d) 1 : 5

16) A "Demolition Contract" for a building is awarded to the **(GATE EE 2025)**

a) Lowest Bidder
b) Highest Bidder
c) Second Lowest Bidder
d) Second Highest Bidder

17) Bulking of sand is highest in **(GATE EE 2025)**

a) Coarse sand
b) Medium sand
c) Fine sand
d) Sand saturated with water

18) The Venice Charter (1964) led to the establishment of **(GATE EE 2025)**

a) International Centre for the Study of the Preservation and Restoration of Cultural Property (*ICCROM*)
b) International Council on Monuments and Sites (*ICOMOS*)
c) Indian National Trust for Art and Cultural Heritage (*INTACH*)
d) Archaeological Survey of India (*ASI*)

19) The ratio between *illumination at a working point indoor to total light available simultaneously outdoor* is known as **(GATE EE 2025)**

a) Daylight Factor
b) Sky Component
c) Internally Reflected Component
d) Externally Reflected Component

20) Which of the following vehicular traffic intersections converts all crossing into merging and diverging sequences? **(GATE EE 2025)**

a) Rotary
b) Manual Signaling
c) Grade Separation
d) Automatic Signaling

21) The process of spraying Polyester, Polyurethane, Acrylate and Epoxy Plastic, followed by heat curing onto metals is called **(GATE EE 2025)**

a) Anodizing
b) Galvanizing
c) Vitreous Enameling
d) Powder Coating

22) The fundamental right pertaining to property ownership in India **DOES NOT** embrace: **(GATE EE 2025)**

a) Sell, Lease, Donate or Bequeath
b) Mortgage
c) Grant Easement
d) Change in use

23) Match the **Elements** in Group I with their **Applications** in Group II. **(GATE EE 2025)**

Group I	**Group II**
P. Bracket	1. Door
Q. Baluster	2. Dome
R. Keystone	3. Cornice
S. Holdfast	4. Arch
	5. Staircase

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

24) Match the **Buildings** in Group I with their **Principal Architects** in Group II.

P. Werner Centre for the Visual arts,Ohio	1. I.M.Pie
Q. Vitra Fire station,Weilam Rhein,Germany	2. Peter Eisenman
R. AT & T Building, New York	3. Louis Kahn
S. Sher-e-Banglanagar,Dacca	4. Zaha Hadid
	5. Philip Johnson

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

25) A combination of colours forming an equilateral triangle in a Colour Wheel is called

a) Analogous Scheme
b) Triad Scheme
c) Split Complementary Scheme
d) Double Complementary Scheme

26) Desire Line diagram helps in
a) Completion of a project by a desired date
b) Meeting demand and supply in desired category of housing
c) Determining income versus expenditure pattern of individuals
d) Origin-Destination analysis in transport planning

27) As per Fire Safety norms of NBC India for buildings having assembly and institutional occupancies, the maximum travel distance in meters to an exit from the dead end of a corridor is

a) 30
b) 24
c) 12
d) 6

28) Which of the following is a part of a studio apartment?
a) Master bed room
b) Artist's room
c) Multipurpose space
d) Children's room

29) The Saturation level of a colour represents

a) Distribution
b) Brilliance
c) Density
d) Warmth

30) Invert level of a pipe at a given cross section refers to the

a) highest point of the internal surface
b) lowest point of the internal surface
c) highest point of the external point
d) lowest point of the internal point

31) The command DVIEW in AutoCAD permits to view
a) a selected portion of the drawing in detail
b) the entire screen on the monitor
c) a perspective of the drawing
d) a damaged part of the drawing

32) Match the **Land use categories** of Group-I with their respective **Colour codes** in Group-II as per practice in India.

P. Residential	1. Red
Q. Commercial	2. Grey
R. Industrial	3. Blue
S. Public / Semi-Public	4. Violet
	5. Yellow

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

33) A rectangular beam section of size 300mm $\times$ 500mm (depth) is loaded with a shear force of 600kN .The maximum shear stress on the section in N/mm^2 is _____

34) In a 50meter section of a waste water pipe, if the gradient is 1 in 80 ,then the fall in millimeter is _____

35) A 15meter long 3meter wide driveway needs to be paved with 300mm $\times$ 300mm square tiles. If each packet contains 30 number of tiles,then the number of packets to be procured to pave the

36) Match the **Monuments** in Group I with their **Features** in Group II. **(GATE EE 2025)**

Group I	Group II
P. Panch Mahal,Fathepur sikri	1. Painted Stone Figures
Q. Meenakshi Temple,Madhurai	2. Intricate Red Sand Stone Carvings
R. Jor-Bangla Temple,Bishnupur	3. Granite Statues
S. Sun Temples,Konark	4. Khondalite Stone Work
	5. Terracotta Carvings

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

37) Match the **Monuments** in Group I with their **Style of Architecture** in Group II **(GATE EE 2025)**

P. Pisa Cathedral,Italy	1. Gothic
Q. St.Hagia Sophia,Isthanbul	2. Moorish
R. Great Temple of Aman,Karnak	3. Egyptian
S. Cathedral of Notre Dame,Paris	4. Byzantine
	5. Romanesque

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

38) Match the **Buildings** in Group I with their **style of Architecture** in Group II. **(GATE EE 2025)**

Group I	Group II
P. Rashtrapathi Bhawan,New Delhi	1. Industrial Architecture
Q. German Pavilion for World Exhibition,Barcelona	2. Deconstruction
R. Guggenheim Museum,Bilbao	3. Radical Eclecticism
S. Cathedral of Notre Dame,Paris	4. Byzantine
	5. Romanesque

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

39) Match the **Terms** in Group I with their **Definitions** in Group II. **(GATE EE 2025)**

P. Kinesthesia	1. Measurement and study of size and propositions of human body
Q. Anthropometry	2. Study of man-machine interaction
R. Ergonomics	3. Study of past and present of the human race
S. Biomimicry	4. Study of human sensory experience during movement
	5. Imitation of models,system and elements of nature

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

40) Match the following **Urban Spaces** in Group I with their **Names** in Group II. **(GATE EE 2025)**

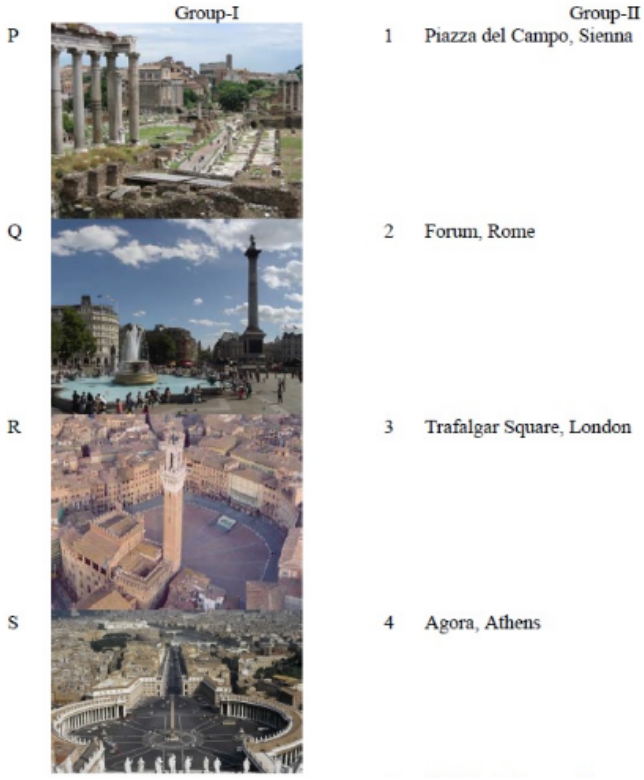

Fig. 40.

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

41) Match the **Terms** in Group I with the appropriate **Items** in Group II. **(GATE EE 2025)**

Group I	**Group II**
P. Toposheet	1. Path/Row
Q. Satellite Image	2. Contour
R. Wavelength	3. Focal Length
S. Scan Line	4. Spectral Signature
	5. Bits/inch

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

42) Match the **Concepts** in Group I with their appropriate **Explanation** in Group II. **(GATE EE 2025)**

Group I	**Group II**
P. Planned Unit Development	1.Development occuring on vacant or underused lots in otherwise built up areas
Q. Infill Development	2. Development providing a fair and equitable way to integrate peri-urban areas
R. Transit Oriented Development	3. Developing a large area as a single entity merging zoning and subdivision control
S. Mixed Use Development	4. Development with compatible land uses integrating varied activities at different times of day
	5. Development located within walking distance from mass transit stations along the corridor

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

43) Particles of soil in **descending order** of grain size is

a) Gravel-Sand-Silt-Clay
b) Gravel-Sand-Clay-Silt
c) Sand-Gravel-Clay-Silt
d) Clay-Gravel-Sand-Silt

44) Match the **Units** in Group I with their **Definition** in Group II. **(GATE EE 2025)**

Group I	**Group II**
P. Hertz	1. Newton-meter
Q. Lux	2. $Cycles/second$
R. Joule	3. $Lumen/m^2$
S. Newton	4. $Watt/ampere$
	5. kg-$meter/sec^2$

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

45) Match the **Energy Efficient Building Elements** in Group I with their associated **Working Principles** in Group II. **(GATE EE 2025)**

Group I	**Group II**
P. Solar Chimney	1. Thermal Storage
Q. Earth Air Tunnel	2. Radiant Cooling
R. Trombe Wall	3. Stack Effect
S. Chilled Slab	4. Cross Ventilation
	5. Geothermal Energy

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

46) Match the **Vibrator Types** in Group I with their related **Areas of Application** in Group II.**(GATE EE 2025)**

Group I	**Group II**
P. Needle Vibrator	1. Concrete Pavement
Q. Shutter Vibrator	2. Pre-cast Concrete Unit
R. Surface Vibrator	3. Beam-Column Junction
S. Table Vibrator	4. Retaining Wall
	5. Slip Forming

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

47) Match the type of **Temporary Structures** in Group I with their corresponding **Functions** in Group II. **(GATE EE 2025)**

Group I	**Group II**
P. Scaffolding	1. To support unsafe structure
Q. Formwork	2. To support platforms for workmen and materials at raised height during constuction
R. Shoring	3. Removal of water from pits
S. Underpinning	4. Mould for RCC structure
	5. Strengthening the existing foundation

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

48) Match the following **Scientific Names** in Group I with their common **Indian Names** in Group II. **(GATE EE 2025)**

Group I	Group II
P. Lagerstroemia speciosa	1. Amaltas
Q. Cassia fistula	2. Neem
R. Azadarachta indica	3. Jarul
S. Acacia auriculiformis	4. Babul
	5. peepal

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

49) A man starts from his residence and uses the following modes in sequence to reach his office by cycle rickshaw to railway station,then train to destination station,followed by auto-rickshaw to nearby bus stand and finally a bus to his office.Which of the following describes his sequence of transit usage ?

a) Non Motorised Transit-Paratransit-Mass Transit-Public Transit
b) Paratransit-Public Transit-Non Motorised Transit-Mass Transit
c) Private Transit-Public Transit-Non Motorised Transit-Mass Transit
d) Non Motorised Transit-Mass Transit-Paratransit-Public Transit

50) PMGSY and JNNURM are two Indian Government programmes which deal with

a) rural road development and urban basic service improvement respectively
b) rural sanitation service and under-developed road maintenance respectively
c) peri-urban basic services and urban basic service improvement respectively
d) rural road development and urbans transport development respectively

51) Match the **Planning Terms** in Group I with their **Descriptions** in Group II. **(GATE EE 2025)**

P. Gentrification	1. Haphazard and low density outward growth of urban are
Q. Urban core revitalization	2. Primarily dormitory settlement with functional depende on parent city
R. Urban sprawl	3. Replacement of low income residents with high inco population
S. Satellite town	4. Physical and socio-economic revival of the inner-city
	5. Restricted development in an environmentally sensitive z

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

52) Match the **Planning Concepts** in Group I with their **Corresponding proponents** in Group II.**(GATE EE 2025)**

Group I	Group II
P. Broadacre city	1. Le Corbusier
Q. Radiant city	2. F.L.Wright
R. Industrial town	3. Robert Owen
S. Acrosanti	4. Henry Wright
	5. Paolo Soleri

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

53) The housing stock of a town has total number of 9090 dwelling units.Present population of the town is $45,450$.Assuming an average household size of 4.5,the housing shortage in percentage is _____ **(GATE EE 2025)**

54) A hall is 15 m long and 12 m wide.If the sum of areas of the floor and cieling is equal to the sum of the area of its four walls,then the volume of the hall in cubic meter is _____ **(GATE EE 2025)**

55) The actual roof area of a building is $3,60,000$sqm which on a site plan measures 25sqcm The scale of the site plan is 1:_____ **(GATE EE 2025)**

56) If the annual net income from the commercial property is Rs $22,000$/- and the interest is 8% then the capitalized value in rupees of the property in perpetuality is _____ **(GATE EE 2025)**

57) A five storied building is constucted on a $100\text{m} \times 50\text{m}$ plot having ground coverage of 60% (option 1).Alternatively ,a four storied building is constructed on the same plot with a 50% ground coverage (option 2).The ratio of FARs between options 1 and 2 is _____ **(GATE EE 2025)**

58) If a roof is treated with a layer of thermal insultation material ,the internal heat gain is reduced by 60% The U-value of the roof slab (without thermal insultation) is $3Wm^2/^\circ C$ Assuming a constant temparature difference between indoor the U-value of the thermal insulation layer in $Wm^2/^\circ C$ is _____ **(GATE EE 2025)**

59) A simply supported beam having effective span of 5meter is carrying a centrally concentrated load of 16kN.The maximum bending moment in the beam in kN-m is _____ **(GATE EE 2025)**

60) A landscaped garden with irregular profile and minor undulations,measuring $35,000$sqm has a totl surface area covered with 20% brick paving,15% cement concrete paving,and rest with grass.The peak intensity of rainfall in tht region is $70mm/hr$.The coefficient of runoff for brick paving, cement concrete paving and grass is $0.8, 0.9$ and 0.5 respectively.The estimated quantity of runoff in $cubicmeter/hr$ for the entire garden area is _____ **(GATE EE 2025)**

61) The number of standard cement bags required to prepare 1400kg of concrete in the ratio 1 : 2 : 4 (mixed by weight batching) is _____ **(GATE EE 2025)**

62) A classroom measuring 10m $(L) \times 8\text{m}$ $(B) \times 2.7\text{m}$ (H) requires an illumination level of 500 lux on the desk level using 40W fluorescent lamps with rated output of 5000 lumens each.Assuming utilization factor of 0.5 and the maintenance factor of 0.8, the number of lamps required is _____ **(GATE EE 2025)**

63) Area of tensile steel per meter width of a reinforced concrete slab is 355sq mm. If 8mm rods are used as reinforcement,then centre to centre spacing of the reinforcement in mm is _____ **(GATE EE 2025)**

64) The population of a town as per census 2011 was $22,730$ and the population as per census 2001 was $15,770$.Considering arithmetic projection of growth,the projected population in 2016 will be _____ **(GATE EE 2025)**

65) Two concrete mixers of capacity 200litres each are used in a construction site to produce 20cubic meter of concrete .Ingredient charging ,mixing and discharge times are 3 minutes ,7 minutes and 1 minute respectively.Assuming a time loss of 5 minutes per hour of operation, the total time in hours for the mixers to produce the required amount of concrete will be _____ **(GATE EE 2025)**