

General Aptitude (GA)

Q.1 – Q.5 Carry ONE mark Each

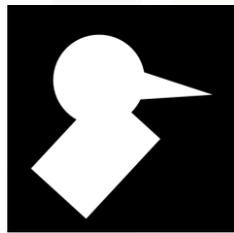
Q. 1	Verbosity : Brevity :: Insolence : _____ Choose the word that best fills the blank.
(A)	Innocence
(B)	Respect
(C)	Solace
(D)	Wealth
Q.2	The product of the digits of a three-digit number is 70. The sum of the digits of this three-digit number is _____
(A)	12
(B)	14
(C)	16
(D)	18

Q.3

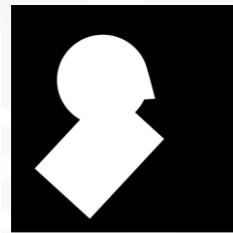
The four pieces of a puzzle are shown in the figure below.



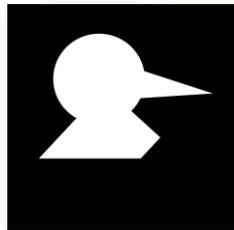
Which one of the figures labelled as P, Q, R, and S can be constructed by using each of the four pieces only once without overlaps?



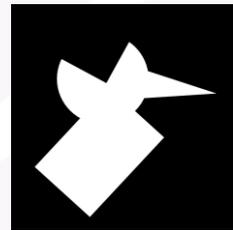
P



Q



R



S

(A)

P

(B)

Q

(C)

R

(D)

S



Q.4	Consider two distinct positive real numbers m, n , with $m > n$. Let $x = n^{\log_{10}(m)}$ and $y = m^{\log_{10}(n)}$. The relation between x and y is _____.
(A)	$x > y$
(B)	$x < y$
(C)	$x = y$
(D)	$x = \log_{10}(y)$

Q.5	‘If his latest movie had been a commercial success, the actor would have made enough money to sponsor his next movie.’ Based only on the above sentence, which one of the following statements is true?
(A)	The actor will certainly sponsor his next movie.
(B)	His latest movie was a commercial success.
(C)	The actor made enough money from his latest movie.
(D)	His latest movie was not commercially successful.

Q.6 – Q.10 Carry TWO marks Each

Q.6	<p>‘My friend and I parted ___ the door ___ the cabin that I had rented ___ the night.’</p> <p>Choose the option with the correct sequence of words to fill the blanks.</p>
(A)	at; of; for
(B)	for; at; of
(C)	of; for; in
(D)	in; of; for
Q.7	<p>Five integers are picked from 0 to 20, with possible repetitions, such that their mean is 12, median is 18, and they have a single mode of 20.</p> <p>Ignoring permutations, the number of ways to pick these five integers is _____</p>
(A)	0
(B)	1
(C)	2
(D)	3

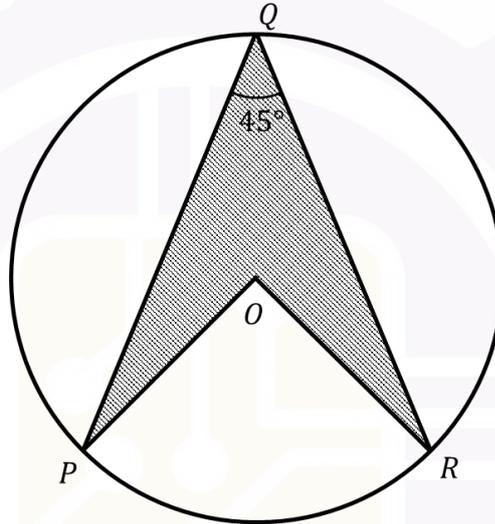
Q.8	<p>Rishi and Swathi are students of Class 5. Pavan and Tanvi are students of Class 4. Rishi and Pavan are boys. Swathi and Tanvi are girls. The four students played a total of three games of chess. The games were played one after another. A player who lost a game did not participate in any more games. It was observed that:</p> <ul style="list-style-type: none"> (i) the first game was the only game where two students of the same class played against each other, (ii) the students of Class 5 won more games than the students of Class 4, and (iii) the boys won two games and the girls won one game. <p>The student who did not lose any game is _____.</p>
(A)	Pavan
(B)	Rishi
(C)	Swathi
(D)	Tanvi

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Q.9	<p>$P, Q, R, S, X,$ and Y are distinct single-digit whole numbers taking values from 0 to 9.</p> <p>PQ is a two-digit number with Q being in the units place and P in the tens place. Similarly, RS is a two-digit number.</p> <p>It is known that PQ and RS are consecutive numbers and $(PQ)^2 + (RS)^2 = XYP$, with XYP being a three-digit number.</p> <p>The value of Y is _____</p>
(A)	4
(B)	5
(C)	6
(D)	7

Q.10

In the given figure, P , Q , and R are three points on a circle of radius 10 cm with O as its center, $\overline{PQ} = \overline{RQ}$, and $\angle PQR = 45^\circ$. The figure is representative. The area of the shaded region $PQRO$ is _____ cm^2 .



(A) 50

(B) $25\sqrt{2}$

(C) $50\sqrt{2}$

(D) 100

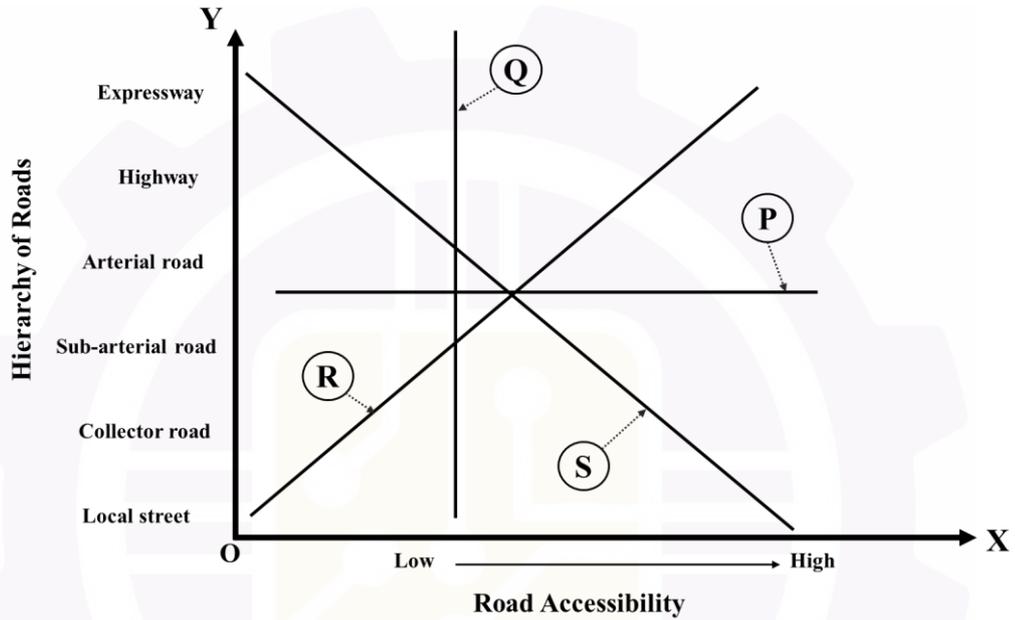
PART A: COMMON FOR ALL CANDIDATES

Q.11 – Q.28 Carry ONE mark Each

Q.11	The five elements of Ekistics as defined by C.A. Doxiadis are <i>Nature, Man, Society</i> , _____, and <i>Networks</i> .
(A)	<i>Shells</i>
(B)	<i>Livestock</i>
(C)	<i>Wealth</i>
(D)	<i>Land</i>
Q.12	An earthquake originates at _____.
(A)	Epicenter
(B)	Hypocenter
(C)	Gyrocenter
(D)	Ground Zero

Q.13

The figure below shows road accessibility on the X-axis and hierarchy of roads on the Y-axis. The line which represents their correct relationship is _____.



(A) P

(B) Q

(C) R

(D) S

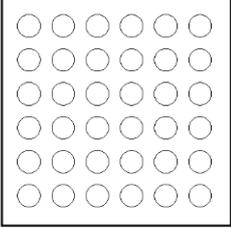
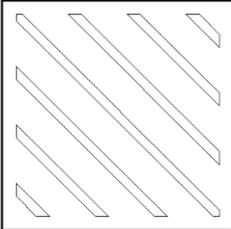
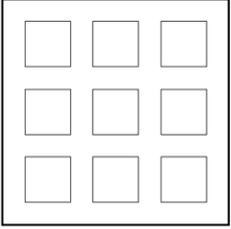
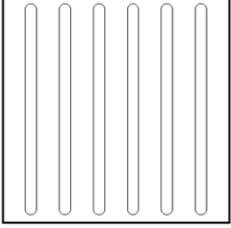


Q.14	As per the National Building Code of India 2016, the minimum fire resistance of service ducts and shafts is _____ minutes.
(A)	45
(B)	60
(C)	120
(D)	240
Q.15	On a topographic map, increasing spacing between successive contour lines uphill represents a _____ slope.
(A)	concave
(B)	convex
(C)	uniform
(D)	waning

Q.16	As per the UN's Sustainable Development Goals (SDGs), _____ aims to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture.
(A)	SDG 2
(B)	SDG 3
(C)	SDG 6
(D)	SDG 11
Q.17	According to the <i>Neighbourhood Unit</i> concept proposed by Clarence A. Perry, the maximum radius for walking to the nearest elementary school is _____ miles.
(A)	0.25
(B)	0.5
(C)	1
(D)	1.5

Q.18	Which of the following is/are the correct order of processes in the water cycle?
(A)	Evaporation – Condensation – Precipitation
(B)	Precipitation – Infiltration – Interception
(C)	Condensation – Percolation – Infiltration
(D)	Infiltration – Percolation – Aquifer Recharge
Q.19	As per the Municipal Solid Waste Management Manual by the Central Public Health and Environmental Engineering Organisation (CPHEEO) published in 2016, which of the following is/are listed in the 3R principles?
(A)	Recover
(B)	Recycle
(C)	Reduce
(D)	Repair

Q.20	Which of the following is/are vertical(s) in the Pradhan Mantri Awas Yojana Urban 2.0 (PMAY- U 2.0)?
(A)	In-situ Slum Redevelopment (ISSR)
(B)	Affordable Housing in Partnership (AHP)
(C)	Affordable Rental Housing (ARH)
(D)	Beneficiary-led Construction (BLC)
Q.21	Which of the following is/are mandatory requirement(s) of an area to be declared as ODF++ under the Swachh Bharat Mission of Government of India?
(A)	All households have piped water connection.
(B)	All households have rainwater harvesting systems.
(C)	All sludge and sewage are safely managed and treated, with no discharge into the open environment.
(D)	All households have dry and wet waste segregation systems.

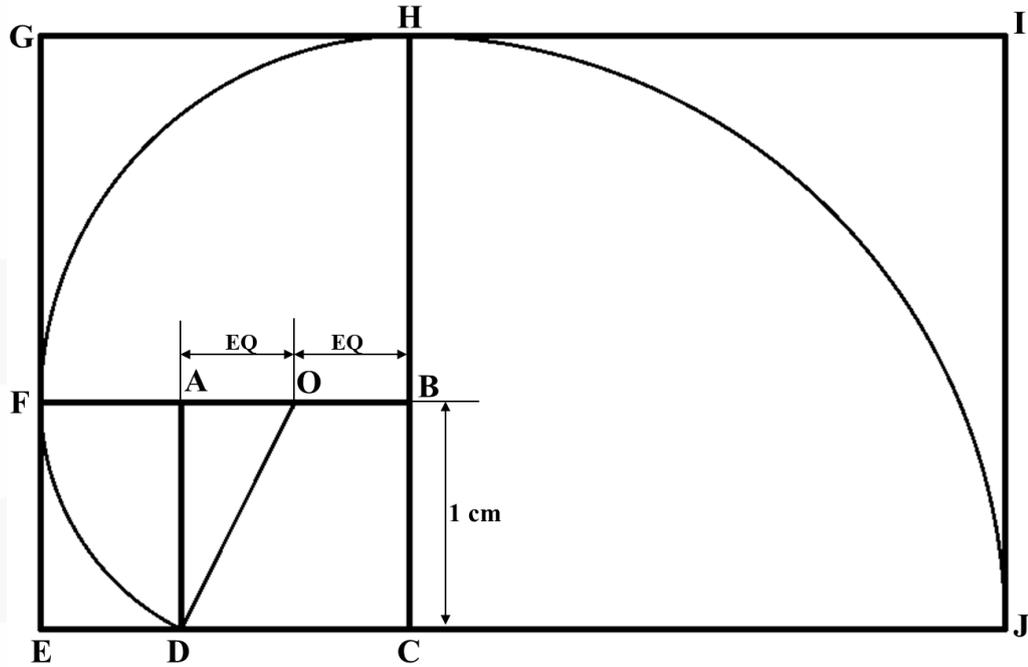
Q.22	In India, as per the Rights of Persons with Disabilities Act, 2016, which of the following plans represent(s) tactile tile(s) for assisting mobility of visually impaired persons?
(A)	
(B)	
(C)	
(D)	



Q.23	Which of the following is/are Eco-system Service(s) offered by forests?
(A)	Regulating
(B)	Provisioning
(C)	Cultural
(D)	Geo-political
Q.24	The minimum number of masonry units of size $200\text{ mm} \times 100\text{ mm} \times 100\text{ mm}$ each, required to construct a solid dry wall of length 3 m, height 2 m, and thickness 0.20 m, is _____ (<i>in integer</i>).
Q.25	A commercial property has a total floor space of $15,000\text{ m}^2$, consisting of $\frac{2}{3}$ rd office space and $\frac{1}{3}$ rd retail space. The parking standards considered in this property for office and retail spaces are 6 and 4.5 Equivalent Car Space (ECS) per 100 m^2 , respectively. The total number of ECS required for the retail space in this property is _____ (<i>in integer</i>).
Q.26	For a computer lab, a set of furniture has just been purchased at the cost of Rs. 8,50,000. The useful life of this furniture is 8 years. If the annual depreciation rate is 15%, then the salvage value of this furniture (in Rs.) is _____ (<i>rounded off to the nearest integer</i>).

Q.27

The geometric construction of a golden mean rectangle is shown in the figure below. It starts with a square **ABCD** of 1 cm side. Continuing the development of the golden mean rectangles, the derived length of **IJ** (in cm) is _____ (rounded off to three decimal places).

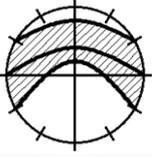
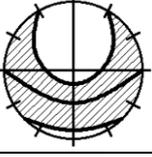
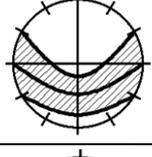
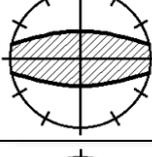
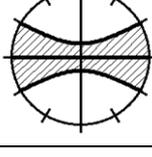


Q.28

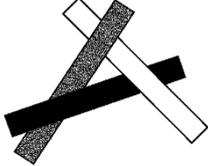
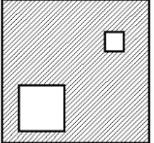
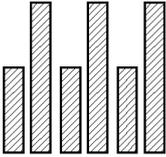
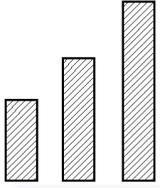
If a site of 1,00,000 m² accommodates 500 dwelling units (DU), then the residential density (in DU/acre) is _____ (rounded off to nearest integer).

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Q.29 – Q.49 Carry TWO marks Each

Q.29	Match the following <i>cities</i> in Group-I with their corresponding <i>sun path diagrams</i> in Group-II .			
	Group-I		Group-II	
	P	New Delhi	1	
	Q	Singapore	2	
	R	Sydney	3	
	S	Helsinki	4	
		5		
(A)	P – 1, Q – 5, R – 3, S – 2			
(B)	P – 2, Q – 4, R – 5, S – 1			
(C)	P – 3, Q – 5, R – 1, S – 2			
(D)	P – 3, Q – 4, R – 1, S – 5			

Q.30 Match the following *graphical representations* in **Group-I** with their *associated terms* in **Group-II**.

Group-I		Group-II	
P		1	Progression
Q		2	Alternation
R		3	Spatial Tension
S		4	Interlacing
		5	Interlocking

(A) P – 5, Q – 2, R – 3, S – 1

(B) P – 4, Q – 5, R – 3, S – 2

(C) P – 4, Q – 3, R – 2, S – 1

(D) P – 5, Q – 3, R – 2, S – 4



Q.31 Match the following *city planning concepts* in **Group-I** with their *proponents* in **Group-II**.

Group-I		Group-II	
P	City Beautiful	1	Robert Owen
Q	Conservative Surgery	2	Daniel Burnham
R	Happy City	3	Patrick Geddes
S	Garden City	4	Charles Montgomery
		5	Ebenezer Howard

(A) P – 2, Q – 5, R – 1, S – 4

(B) P – 2, Q – 3, R – 4, S – 5

(C) P – 4, Q – 3, R – 2, S – 5

(D) P – 1, Q – 2, R – 4, S – 3



Q.32 Match the following *tree species* in **Group-I** with the *colour of their flowers* in **Group-II**.

Group-I		Group-II	
P	<i>Cassia fistula</i>	1	Scarlet red
Q	<i>Jacaranda mimosifolia</i>	2	Orange
R	<i>Erythrina indica</i>	3	White
S	<i>Plumeria alba</i>	4	Violet blue
		5	Bright yellow

(A) P – 1, Q – 4, R – 5, S – 2

(B) P – 5, Q – 2, R – 4, S – 3

(C) P – 5, Q – 4, R – 1, S – 3

(D) P – 2, Q – 3, R – 1, S – 4

Q.33 Match the following *Books* in **Group-I** with their corresponding *Authors* in **Group-II**.

Group-I		Group-II	
P	Silent Spring	1	Rachel Carson
Q	Handbook of the Birds of India and Pakistan	2	Madhav Gadgil
R	Small is Beautiful	3	Ramachandra Guha
S	The Unquiet Woods	4	Salim Ali and S. D. Ripley
		5	E. F. Schumacher

(A) P – 5, Q – 1, R – 4, S – 2

(B) P – 2, Q – 4, R – 5, S – 3

(C) P – 1, Q – 3, R – 2, S – 5

(D) P – 1, Q – 4, R – 5, S – 3

Q.34 Match the following *terms* in **Group-I** with their corresponding *descriptions* in **Group-II**.

Group-I		Group-II	
P	VAV	1	Continent-ocean heat balance system
Q	DEWAT	2	Public transportation system
R	El-Nino	3	Intelligent air conditioning system of building
S	BRTS	4	Water supply monitoring system
		5	Waste water treatment system

(A) P – 3, Q – 5, R – 1, S – 2

(B) P – 2, Q – 5, R – 1, S – 3

(C) P – 3, Q – 4, R – 2, S – 5

(D) P – 1, Q – 3, R – 5, S – 2

Q.35 Match the following *concepts* proposed by Kevin Lynch in **Group-I** with their corresponding *descriptions* in **Group-II**.

Group-I		Group-II	
P	Legibility	1	Perception of a complex reality as an interrelated but single identity
Q	Imageability	2	Recognition of an object in a cityscape as a separate entity that is distinct from other objects
R	Structure	3	Quality in a physical object in a cityscape which gives it a high probability of evoking a strong image
S	Identity	4	Apparent clarity of the cityscape
		5	Pattern relation of the object to the observer and to other objects in a cityscape

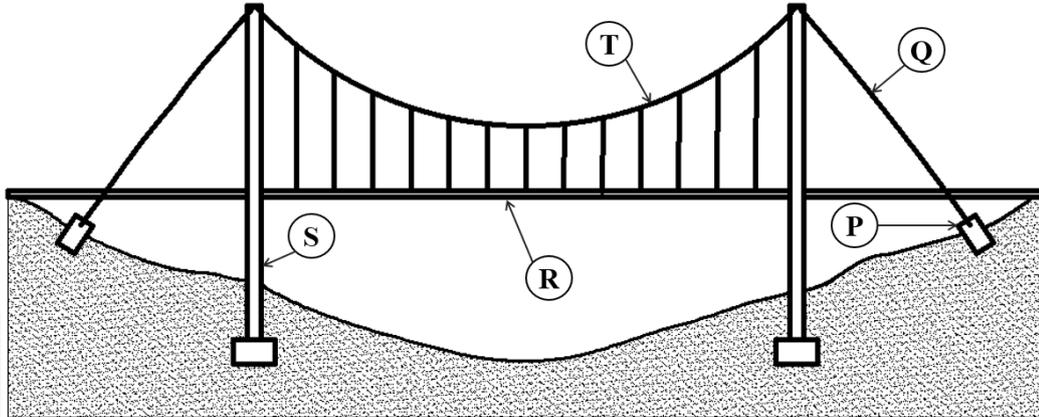
(A) P – 1, Q – 4, R – 5, S – 2

(B) P – 4, Q – 1, R – 2, S – 3

(C) P – 4, Q – 3, R – 5, S – 2

(D) P – 2, Q – 3, R – 4, S – 1

Q.36 Which of the following is/are correct labelling of **P, Q, R, S, T** with respect to the illustration of a *suspension bridge* as shown below?

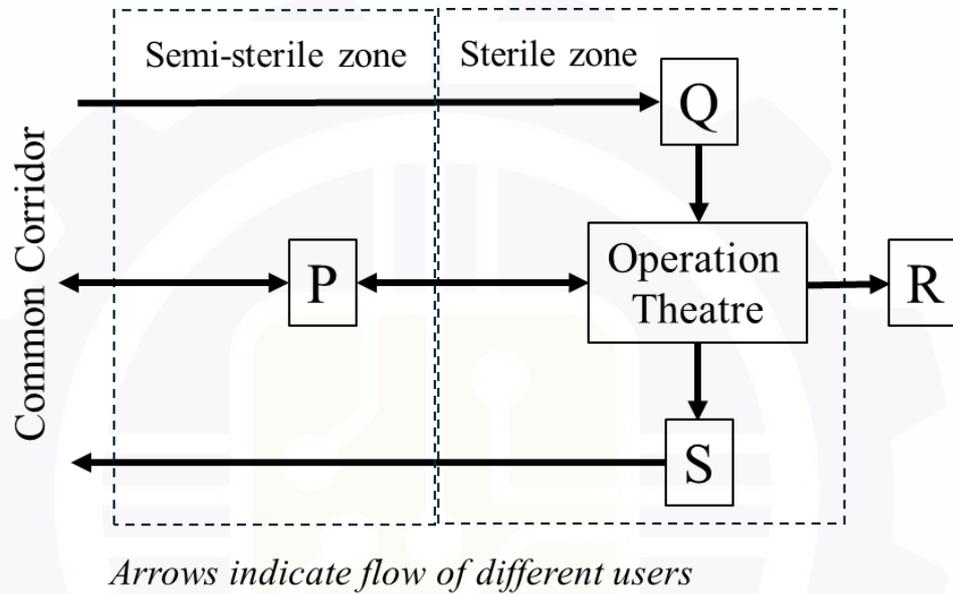


- (A) **Q** – Stay Cable, **R** – Pylon, **T** – Sag
- (B) **P** – Anchorage, **S** – Pylon, **T** – Primary Suspended Cable
- (C) **Q** – Stay Cable, **R** – Stiffening Deck, **S** – Pylon
- (D) **P** – Stiffening Deck, **R** – Pylon, **T** – Primary Suspended Cable

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Q.37

The figure below shows the generic sequence of spaces and direction of movement of users to and from an operation theatre after entering from a common corridor. The spaces are marked as **P**, **Q**, **R**, **S**. Choose the correct option(s).

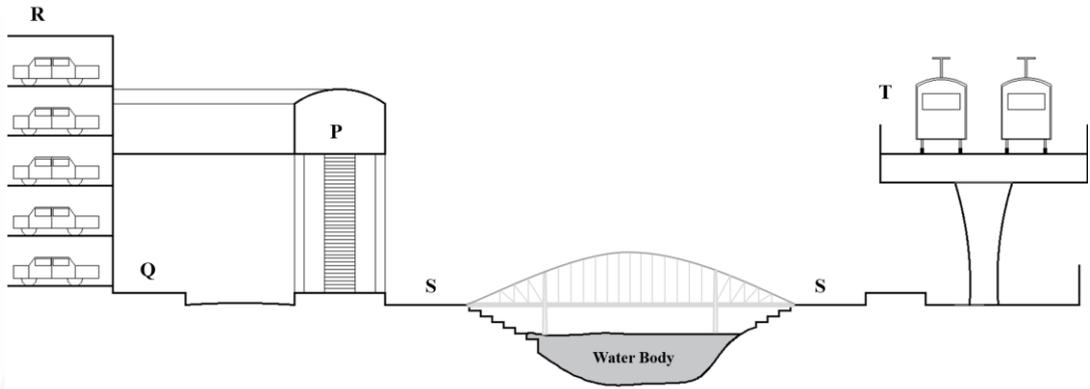


- (A) **Q** – Pre-operative, **R** – Dirty utility, **S** – Dress change
- (B) **P** – Dress change, **Q** – Pre-operative, **R** – Dirty utility
- (C) **P** – Dirty utility, **R** – Dress change, **S** – Pre-operative
- (D) **P** – Dress change, **R** – Dirty utility, **S** – Post-operative

Q.38	Identify from the following, the correct short command key(s) and their respective application(s) in AutoCAD® software.
(A)	AR: Creates multiple copies in rectangular, polar, or path pattern
(B)	BRK: Breaks a block or polyline into individual objects
(C)	CHA: Bevels the edges of two straight line segments
(D)	SXL: Breaks a single object into parts
Q.39	Who among the following is/are the recipient(s) of the <i>Pritzker Architecture Prize</i> till 2025?
(A)	Liu Jiakun
(B)	Santiago Calatrava
(C)	B. V. Doshi
(D)	Charles Correa

Q.40	Which of the following relationships is/are correct with respect to disaster risk in a geographical location?
(A)	$\text{Risk} = \text{Hazard} \times \text{Vulnerability} \times \text{Exposure} \times \text{Capacity}$
(B)	$\text{Hazard} = \text{Risk} \times \text{Capacity} \times \text{Exposure}$
(C)	$\text{Risk} = (\text{Hazard} \times \text{Vulnerability} \times \text{Exposure}) / \text{Capacity}$
(D)	$\text{Exposure} = (\text{Hazard} \times \text{Vulnerability}) / \text{Risk}$
Q.41	Which of the following is/are listed within the responsibilities of Council of Architecture (CoA) as per the Architect's Act 1972?
(A)	Maintaining minimum standards of architectural education in India.
(B)	Maintaining standards for professional conduct of registered architects.
(C)	Maintaining minimum standards for master plan preparation.
(D)	Regulating building material standards for construction projects in India.

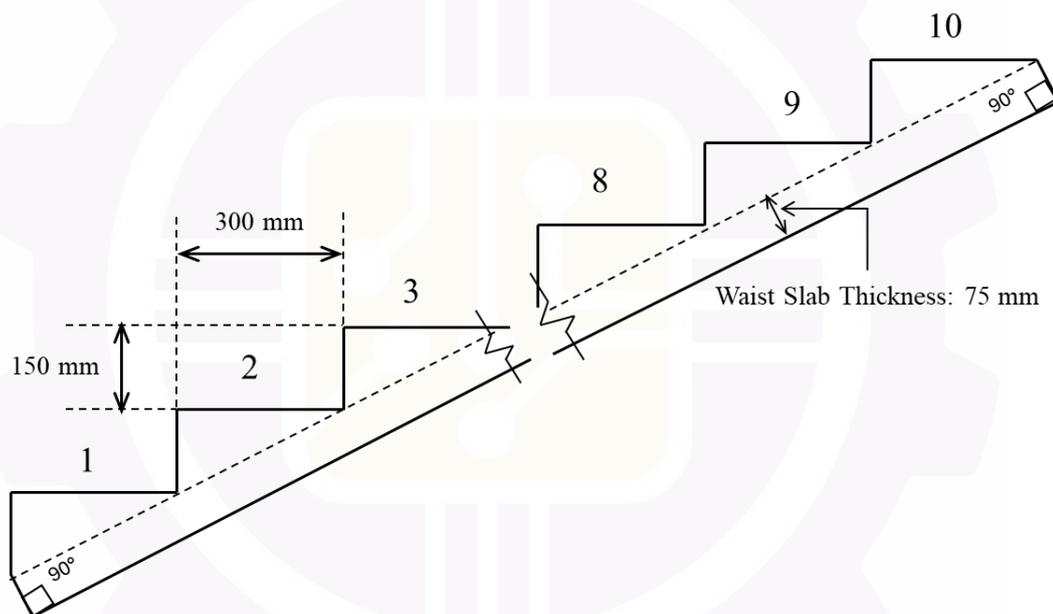


<p>Q.42</p>	<p>Which of the following is/are correct labelling of P, Q, R, S, T with respect to the illustration of a section through a given city?</p> 
<p>(A)</p>	<p>R – Footpath, S – Promenade, T – Mass Rapid Transit Corridor</p>
<p>(B)</p>	<p>P – Skywalk, R – Multi-level car parking, S – Promenade</p>
<p>(C)</p>	<p>Q – Footpath, R – Mass Rapid Transit Corridor, T – Multi-level car parking</p>
<p>(D)</p>	<p>P – Skywalk, Q – Footpath, T – Mass Rapid Transit Corridor</p>
	<p style="text-align: center; font-size: 2em; opacity: 0.5;">GATE 2026 IIT GUWAHATI</p>
<p>Q.43</p>	<p>A city's population in 2025 is 1,75,000 and is expected to increase in the next three decades at a growth rate of 8.5% per decade. In 2055, the estimated per capita domestic water demand will be 175 litres per day. The total daily domestic water demand for the city in 2055 (in million litres per day) will be _____ (rounded off to two decimal places).</p>



Q.44 The section of a R.C.C. staircase flight is shown in the figure below. Each riser and tread of the staircase is 150 mm and 300 mm, respectively. The steps are supported by a 75 mm thick waist slab.

The width of the staircase is 1500 mm. The flight consists of 10 steps. Consider reinforcement to be 0.75% by volume of the total R.C.C. The density of steel is 7800 kg/m³. The amount of reinforcement required to construct the staircase flight (in kg) is _____ (rounded off to two decimal places).



Q.45 A rectangular open concrete drainage channel has base width of 3 m and flow depth of 1.5 m. The channel bed slope is 0.001. If the Manning's roughness coefficient of concrete used in this channel is 0.018, then the average flow velocity of this channel (in m/s) is _____ (rounded off to two decimal places).



Q.46 A construction project consists of 7 activities. These activities, their connecting events, and the three PERT times (optimistic, likely, and pessimistic), in days, are listed in the table below. The project starts on 27th July 2026. Assuming no holidays for the entire duration of the project except 15th August 2026, the expected date of completion of the project will be _____ August 2026 (*mention the date in integer*).

Activity	Connecting Events	Three PERT Times (in Days)
P	1 → 2	4 – 6 – 8
Q	1 → 3	5 – 6 – 13
R	2 → 5	6 – 8 – 22
S	2 → 3	8 – 11 – 14
T	3 → 5	2 – 4 – 12
U	3 → 4	4 – 8 – 18
V	4 → 5	5 – 7 – 15

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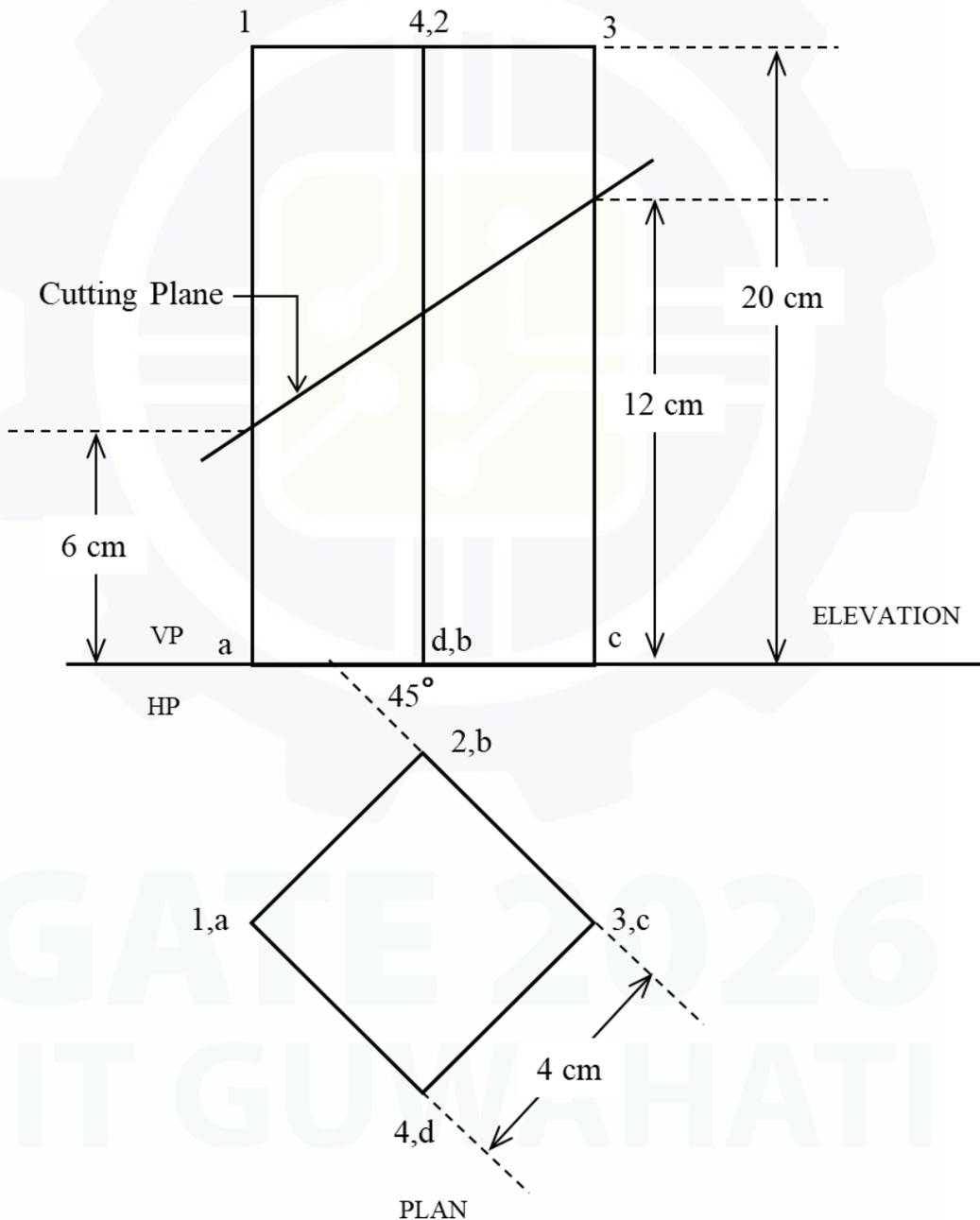


Q.47 A socio-economic survey of a city is planned with a sample size of 1250 persons, having the same proportion of age and sex distribution of the city population, as given in the table below. The required number of representative female respondents of the age group 19 to 40 years, is _____ (rounded off to nearest integer).

Age group (in years)	City Population Distribution (in %)	
	Male	Female
0 to 6	2	1.5
7 to 18	8.5	6
19 to 25	14.5	13.5
26 to 40	14.5	11
41 to 50	12	8
51 to 60	2.5	2.5
60 +	1.5	2

Q.48 An existing four storey building of identical floor plans was built by utilizing the maximum allowable F.A.R. and maximum ground coverage of 50% in a plot of 500 m². Due to incentive zoning, the F.A.R. of the plot has been increased to 2.75. The maximum floor area (in m²) that can now be added to the building is _____ (in integer).

- Q.49 The figure below represents the plan and elevation of a square based prism of base $4\text{ cm} \times 4\text{ cm}$ and height 20 cm . The prism is standing on the horizontal plane (HP) with its faces making an angle of 45° with the vertical plane (VP). A cutting plane, perpendicular to VP, divides the prism as shown in the figure below. The surface area (in cm^2) of the vertical faces of the prism below the cutting plane is _____ (in integer).



PART B1: FOR ARCHITECTURE CANDIDATES ONLY

Q.50 – Q.56 Carry ONE mark Each

Q.50	The circular opening at the top of a dome is termed as
(A)	Oculus
(B)	Lantern
(C)	Rose window
(D)	Clerestory
Q.51	Albedo is the ratio between
(A)	Sensible Heat and Latent Heat
(B)	Reflected Radiation and Insolation
(C)	Absolute Humidity and Saturation Point Humidity
(D)	Indoor Illumination and Outdoor Illumination

Q.52	<i>Setting out of the foundation</i> is a process executed
(A)	after the foundation excavation
(B)	after the foundation concreting
(C)	before the foundation excavation
(D)	before the placing of plinth beam reinforcement
Q.53	Which of the following statements about the elements of <i>Islamic Architecture</i> is/are correct?
(A)	<i>Mimar</i> is a tower-like structure usually associated with mosques or other religious buildings.
(B)	<i>Mashrabiyya</i> is a wooden grille or grate used to cover windows or balconies.
(C)	<i>Mulqaf</i> is a wind-catcher.
(D)	<i>Minbar</i> is a type of pulpit usually found in mosques from which prayers and speeches are given.

Q.54	Which of the following statements is/are correct with respect to <i>temporary structures</i> during construction?
(A)	<i>Centering</i> supports formwork for arches, domes, and slabs.
(B)	<i>Scaffolding</i> provides working platforms for masons.
(C)	<i>Shoring</i> helps in preventing dampness in buildings.
(D)	<i>Underpinning</i> strengthens or deepens foundations.
Q.55	<p>The outdoor and indoor temperature of a room are 18 °C and 22 °C, respectively. There is also an internal heat gain of 5 kW. Consider the volumetric heat capacity of air is 1300 J/m³ degC. Using the ventilation heat flow equation, the estimated rate of ventilation (in m³/s) is _____ (<i>rounded off to two decimal places</i>).</p> <p>Assume no other heat gains or losses and no net heat storage in the space.</p>
Q.56	<p>A column transmits a load of 225 kN to a square footing. The safe bearing capacity of the soil is 100 kN/m². The minimum length (in m) of the side of this safe square footing is _____ (<i>rounded off to one decimal place</i>).</p>

Q.57 – Q.65 Carry TWO marks Each

Q.57	Match the following <i>Architectural Styles</i> in Group-I with their corresponding <i>examples</i> in Group-II .			
	Group-I		Group-II	
	P	Baroque	1	Hagia Sophia, Istanbul
	Q	Byzantine	2	Chrysler Building, New York
	R	Art Deco	3	Seagram Building, New York
	S	Art Nouveau	4	Palace of Versailles, Versailles
		5	Sagrada Familia, Barcelona	
(A)	P – 1, Q – 3, R – 4, S – 5			
(B)	P – 4, Q – 1, R – 2, S – 5			
(C)	P – 4, Q – 5, R – 2, S – 1			
(D)	P – 2, Q – 1, R – 5, S – 3			

Q.58

Match the names of the following *historic palaces* in **Group-I** with their corresponding *locations* in **Group-II**.

Group-I		Group-II	
P	Ujjyanta	1	Orchha
Q	Umaid Bhawan	2	Jammu
R	Jehangir Mahal	3	Jaipur
S	Hari Niwas	4	Agartala
		5	Jodhpur

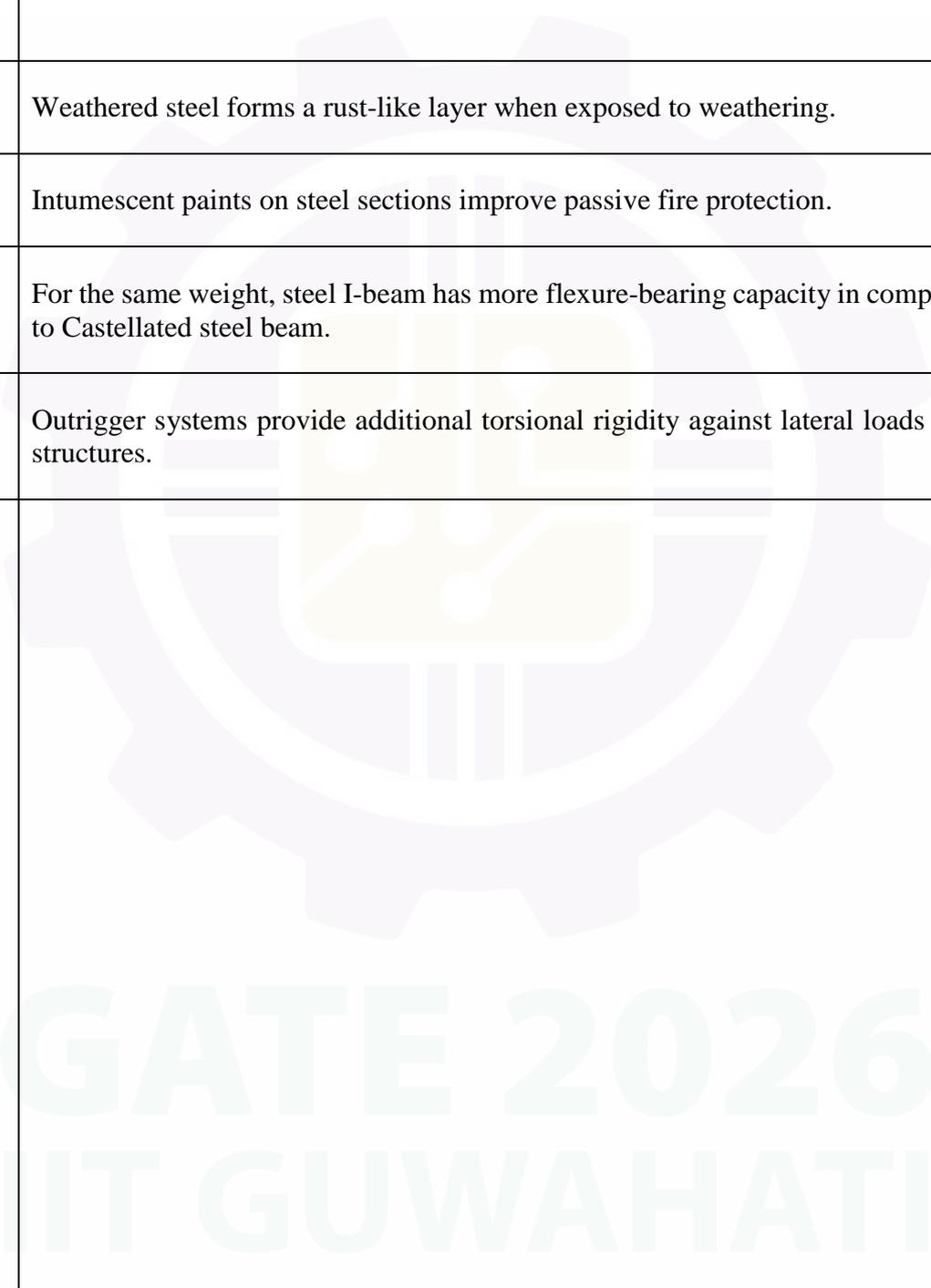
(A) P – 2, Q – 3, R – 1, S – 4

(B) P – 3, Q – 5, R – 4, S – 2

(C) P – 4, Q – 3, R – 2, S – 1

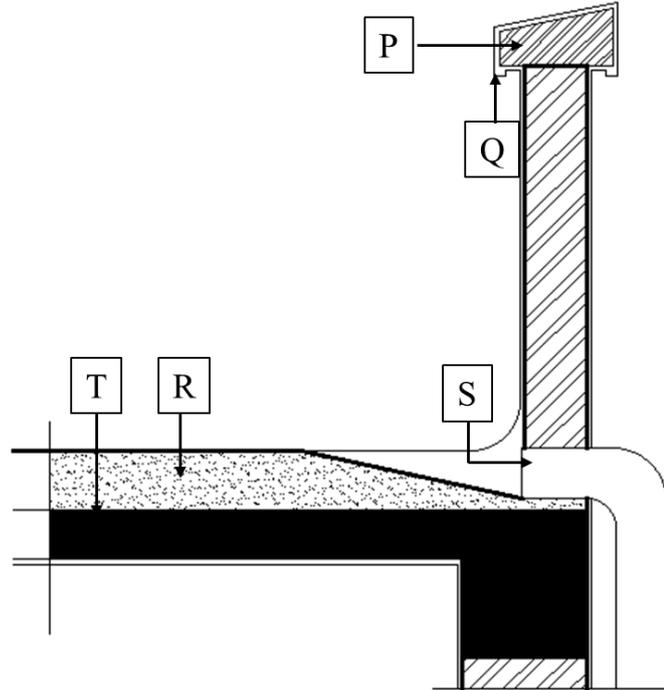
(D) P – 4, Q – 5, R – 1, S – 2

Q.59	As per the National Building Code of India 2016, match the <i>types of glass</i> in Group-I with their corresponding <i>descriptions</i> in Group-II .		
	Group-I		Group-II
	P	Reflective glass	1 Prefab unit of glass having an edge seal that binds the individual sheets together
	Q	Tempered fire-resistant glass	2 Glass into which a wire mesh is embedded during production
	R	Insulating glass units	3 Rolled glass having a distinct pattern on one or both sides
	S	Wired glass	4 Glass with metallic coating reducing heat gain and glare and allowing optimum visible light transmission inside
		5 Glass that breaks into granular fragments, with no large sharp edges	
(A)	P – 5, Q – 4, R – 3, S – 2		
(B)	P – 4, Q – 2, R – 1, S – 3		
(C)	P – 4, Q – 5, R – 1, S – 2		
(D)	P – 1, Q – 5, R – 4, S – 3		

Q.60	Which of the following statements is/are correct in the context of steel construction?
(A)	Weathered steel forms a rust-like layer when exposed to weathering.
(B)	Intumescent paints on steel sections improve passive fire protection.
(C)	For the same weight, steel I-beam has more flexure-bearing capacity in comparison to Castellated steel beam.
(D)	Outrigger systems provide additional torsional rigidity against lateral loads in tall structures.
	

Q.61

The different parts of a parapet wall and terrace section are labelled as **P, Q, R, S, T**. Which of the following is/are correct?

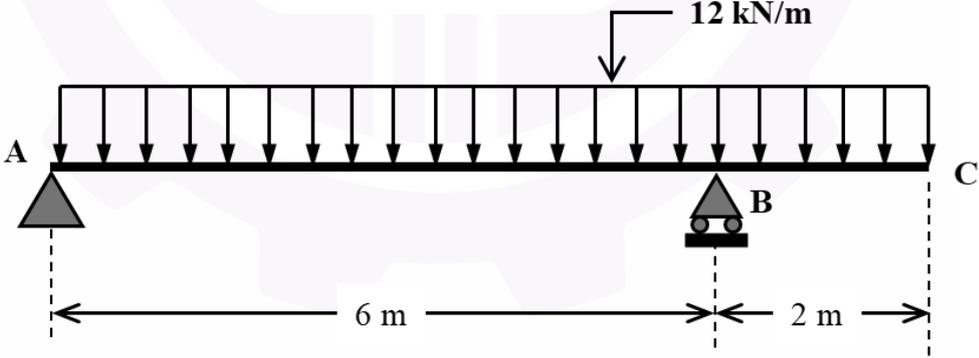


(A) **P** – Coping, **R** – Lime terracing, **S** – Rainwater pipe

(B) **Q** – Drip course, **S** – Rainwater pipe, **T** – Roof slab

(C) **P** – Vent pipe, **Q** – Drip course, **R** – Roof slab

(D) **P** – Vent pipe, **R** – Rainwater pipe, **T** – Roof slab

<p>Q.62</p>	<p>A building facade has 48 m^2 of glazing area. The properties of glass used in the glazing are as follows:</p> <p>U-value: $5.2 \text{ W/m}^2 \text{ }^\circ\text{C}$</p> <p>Light to Solar Gain (LSG) Ratio: 1.5</p> <p>Visual Light Transmittance (VLT): 0.6</p> <p>The average solar radiation on the glazing is 400 W/m^2. If the outdoor and indoor set point temperatures are $35 \text{ }^\circ\text{C}$ and $20 \text{ }^\circ\text{C}$, respectively, then the total heat gain (in kW) through the glazing by conduction and radiation is _____ (rounded off to two decimal places).</p>
<p>Q.63</p>	<p>An overhang beam ABC is loaded with uniformly distributed load (UDL) throughout its entire span as per the figure below. The intensity of UDL is 12 kN/m. The bending moment at an intermediate point P (between A and B) is found to be zero. The length (in m) of the portion AP is _____ (rounded off to two decimal places).</p>  <p>The diagram shows a horizontal beam ABC. Support A is a pin support, and support B is a roller support. The beam extends from A to C. A uniformly distributed load (UDL) of 12 kN/m is applied downwards along the entire length of the beam. The distance between A and B is 6 m, and the distance between B and C is 2 m.</p>
<p>Q.64</p>	<p>A conference room of size $25 \text{ m} \times 12 \text{ m}$ is illuminated by CFL having efficacy of 60 lumen/W. The lighting power density (LPD) of the room is 12 W/m^2. If the utilization and maintenance factors are 0.8 and 0.5, respectively, then the estimated illumination level (in lux) of the conference room is _____ (in integer).</p>

Q.65

The built-up area of a shopping mall is $12,000 \text{ m}^2$ and the percentage share of annual energy consumption from various sources is shown in the table below. The estimated average monthly solar energy consumption of the building is 10 MW-hr. The *Building Energy Index* (BEI) of the shopping mall (in $\text{kW-hr/m}^2/\text{year}$) is _____ (in integer).

Energy source	Percentage share of annual energy consumption
Electricity from grid	52
Diesel for additional power	30
LPG for food court	10
Solar energy	8

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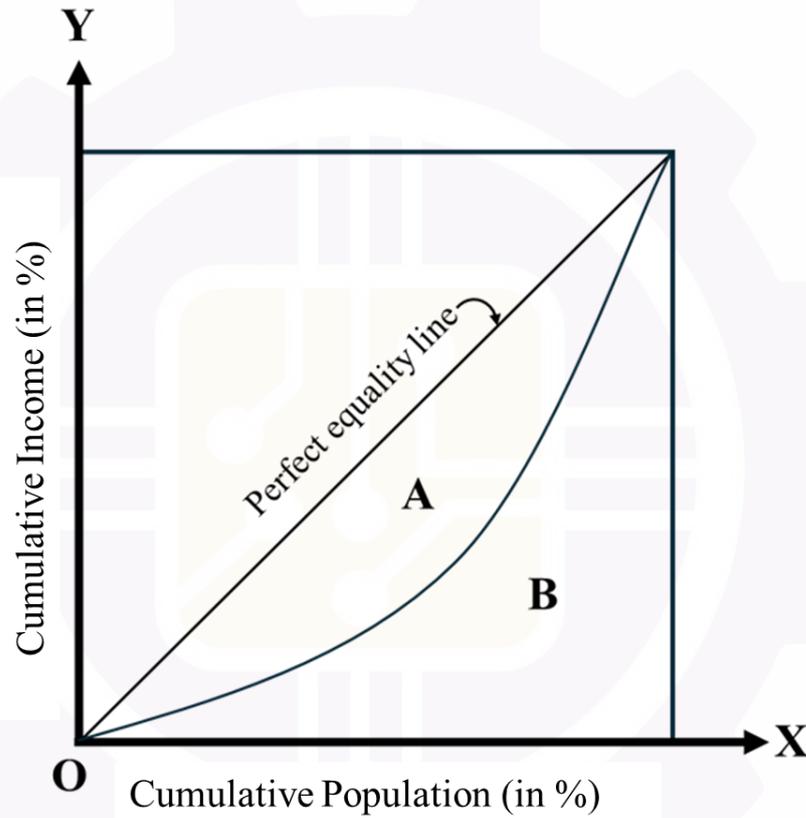
PART B2: FOR PLANNING CANDIDATES ONLY

Q.66 – Q.72 Carry ONE mark Each

Q.66	As per India's National Transit Oriented Development (TOD) Policy, 2017, radius of the influence zone around transit stations for developing compact growth centers, is in the range of _____ m.
(A)	300 to 400
(B)	500 to 800
(C)	600 to 800
(D)	400 to 600
Q.67	The data type used in Digital Elevation Model (DEM) is _____.
(A)	Raster
(B)	Vector
(C)	Tabular
(D)	Rating

Q.68

The graph below shows cumulative population (in %) on the **X**-axis and cumulative income (in %) on the **Y**-axis. If **A** and **B** are areas as shown in the graph, then the Gini coefficient is measured as _____.



(A)

$$\frac{A}{A + B}$$

(B)

$$\frac{A}{B}$$

(C)

$$\frac{A}{B - A}$$

(D)

$$\frac{B}{A}$$

Q.69	In India, which of the following missions is/are part of the National Action Plan on Climate Change (NAPCC), 2008?
(A)	National Mission for Sustaining the Himalayan Eco-system
(B)	National Urban Livelihoods Mission
(C)	National Water Mission
(D)	Swachh Bharat Mission
Q.70	Which of the following options is/are means of <i>first and last mile connectivity</i> with respect to urban transit systems?
(A)	Park and Ride
(B)	Intermediate Public Transport
(C)	Public Bicycle Sharing
(D)	Intercity High-speed Rail

Q.71	Based on Greenshield’s model, a speed-density relationship is developed on the data of a traffic stream. This relationship is represented as $v = 75 - 0.03k$, where v (in km/hr) is the mean speed at density k (in vehicle/km). The jam density (in vehicle/km) of this traffic stream is _____ (in integer).																								
Q.72	<p>In a particular year, the status of Consolidated Funds of India is shown in the table below. For the given data, the fiscal deficit of that year (Rupees in crores) is _____ (in integer).</p> <table border="1" data-bbox="316 692 1385 1252"> <thead> <tr> <th colspan="4" style="text-align: center;">Consolidated Funds of India</th> </tr> <tr> <th style="text-align: center;">Receipt</th> <th style="text-align: center;">Amount (Rupees in Crores)</th> <th style="text-align: center;">Expenditure</th> <th style="text-align: center;">Amount (Rupees in Crores)</th> </tr> </thead> <tbody> <tr> <td>Revenue</td> <td style="text-align: center;">2,65,279</td> <td>Revenue</td> <td style="text-align: center;">3,75,582</td> </tr> <tr> <td>Non-debt capital receipt</td> <td style="text-align: center;">3,646</td> <td>Capital</td> <td style="text-align: center;">31,295</td> </tr> <tr> <td>Recovery of loans and advances</td> <td style="text-align: center;">20,733</td> <td>Disbursement of loans and advances</td> <td style="text-align: center;">38,614</td> </tr> <tr> <td>Public debt</td> <td style="text-align: center;">4,36,689</td> <td>Public debt repayment</td> <td style="text-align: center;">3,21,725</td> </tr> </tbody> </table>	Consolidated Funds of India				Receipt	Amount (Rupees in Crores)	Expenditure	Amount (Rupees in Crores)	Revenue	2,65,279	Revenue	3,75,582	Non-debt capital receipt	3,646	Capital	31,295	Recovery of loans and advances	20,733	Disbursement of loans and advances	38,614	Public debt	4,36,689	Public debt repayment	3,21,725
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Q.73 – Q.81 Carry TWO marks Each

Q.73	Match the following <i>zoning</i> in Group–I with their <i>characteristics</i> in Group–II .			
	Group–I		Group–II	
	P	Form based zoning	1	Strictly segregates different land uses
	Q	Euclidean zoning	2	Provides for urban poor or economically weaker sections in land use planning
	R	Inclusionary zoning	3	Regulates the development by assessing the impacts of land use
	S	Performance zoning	4	Encourages developers to build community amenities in lieu of surplus F.A.R.
			5	Creates a public realm by guiding the building envelope, considering the community's unique characteristics
(A)	P – 5, Q – 1, R – 2, S – 3			
(B)	P – 5, Q – 2, R – 4, S – 3			
(C)	P – 2, Q – 1, R – 4, S – 5			
(D)	P – 3, Q – 4, R – 2, S – 5			

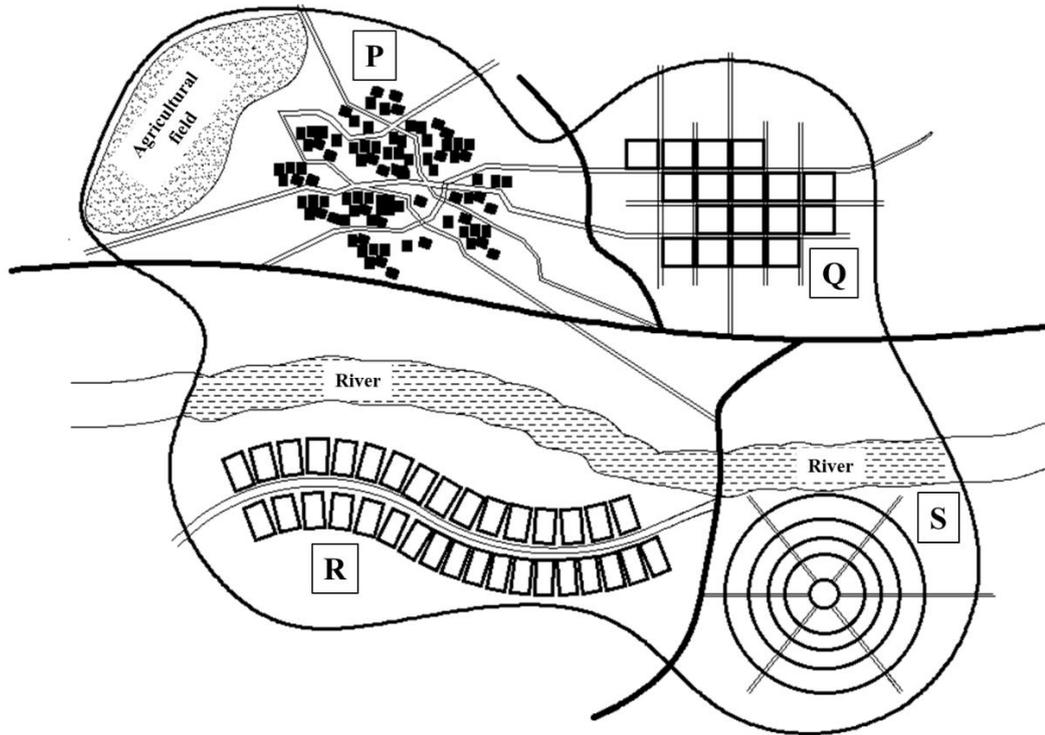


Q.74	Match the following <i>strategies</i> in Group-I with their corresponding <i>descriptions</i> in Group-II .			
	Group-I		Group-II	
	P	Transfer of Development Rights	1	Financial support by the Government for Public-Private-Partnership projects
	Q	Betterment Levy	2	Tax imposed on unused or underdeveloped plots
	R	Viability Gap Funding	3	Award of additional F.A.R. in different locations in exchange of land for public purpose
	S	Vacant Land Tax	4	One-time fee to recover investment for enhanced public infrastructure
		5	Fee for land use change from agriculture to non-agriculture	
(A)	P – 3, Q – 2, R – 1, S – 5			
(B)	P – 1, Q – 3, R – 4, S – 2			
(C)	P – 3, Q – 1, R – 5, S – 2			
(D)	P – 3, Q – 4, R – 1, S – 2			

Q.75	Match the following <i>types of plans</i> in Group–I with their corresponding <i>scope</i> in Group–II , in accordance with the URDPFI Guidelines, 2015.			
Group–I		Group–II		
P	Perspective Plan	1	To identify resources for development and plan for settlements, prepared and regulated by District Planning Committee	
Q	Regional Plan	2	To detail sub-city land use plan and integrate with urban infrastructure	
R	Development Plan	3	To develop vision and provide policy framework for urban and regional development	
S	Local Area Plan	4	To prepare special area plan for towns with special development needs	
		5	To prepare plan for urban areas and peri-urban areas under the control of Metropolitan Planning Committee	
(A)	P – 1, Q – 3, R – 4, S – 2			
(B)	P – 3, Q – 1, R – 5, S – 2			
(C)	P – 3, Q – 1, R – 2, S – 4			
(D)	P – 2, Q – 4, R – 5, S – 3			

Q.76

Which of the following is/are correct labelling of **P**, **Q**, **R**, **S** with respect to the *urban patterns* shown below?



- (A) **P** – Organic, **R** – Linear
- (B) **P** – Organic, **Q** – Linear
- (C) **Q** – Grid Iron, **S** – Radial
- (D) **Q** – Organic, **R** – Radial

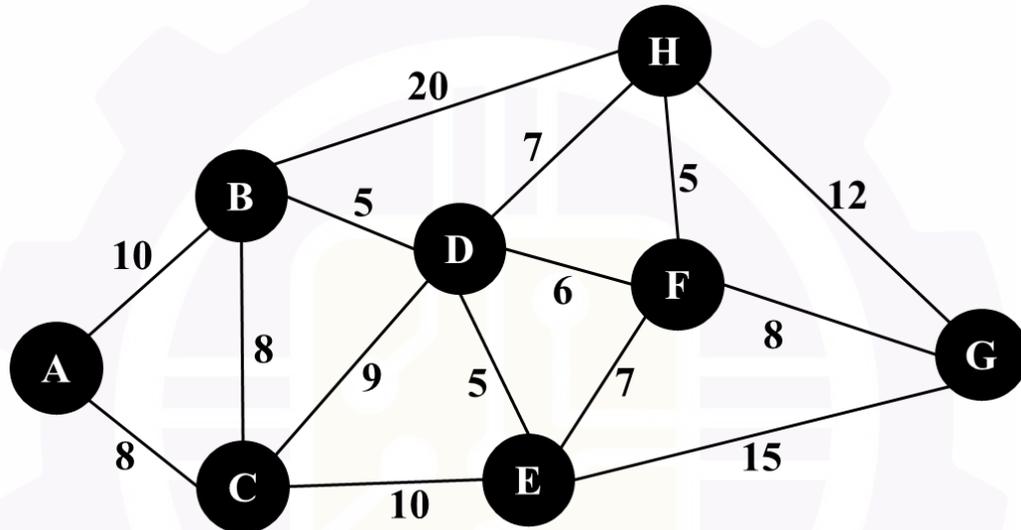


Q.77	Which of the following is/ are passive remote sensing technique(s)?
(A)	Sonar
(B)	Radar
(C)	Aerial photos
(D)	Landsat images
Q.78	A capital investment of Rs. 60,000 has been made at present, expecting an annual return of Rs. 20,000 at the end of each year for a period of 5 years. If the annual discount rate is 5%, then the Net Present Value (in Rs.) is _____ (<i>rounded off to the nearest integer</i>).
Q.79	The demand function of a light rail transit system (LRTS) of a city is represented as $Q = 43000 - 850P$, where Q is the ridership/day and P is the fare/ride. If the existing fare of Rs. 30 per ride is reduced to Rs. 25 per ride, then the consequent increased ridership of the LRTS (in percentage) is _____ (<i>rounded off to two decimal places</i>).

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Q.80

In a transport network, all the nodes (represented by **A, B, C, D, E, F, G, H**) and their connecting links are shown in the figure below. The values mentioned alongside the links represent the travel time (in minutes) between nodes. Following the shortest path, the minimum time required to commute from node **A** to node **G** (in minutes) is _____ (in integer).



Q.81

A classified vehicle count was conducted in the midblock of a two-lane one-way collector road during peak hour (08:00 A.M. – 09:00 A.M.) on a weekday. The vehicle counts and corresponding passenger car unit (PCU) are shown in the table below. If the maximum design capacity per lane of that road is 1300 PCU/hr, then the *volume to capacity ratio* of that road is _____ (rounded off to two decimal places).

Vehicle Type	Hourly Vehicle Count (08:00 A.M. – 09:00 A.M.)	PCU Value
Bus	52	2.50
Truck	24	3.00
Car	720	1.00
Motorized Two-Wheeler	1050	0.50
Auto Rickshaw	275	0.80
E-Rickshaw	410	0.80
Bicycle	90	0.30

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