Q. No	Туре	Section	Кеу	Marks
1	MCQ	GA	С	1
2	MCQ	GA	С	1
3	MCQ	GA	В	1
4	MCQ	GA	C ; D	1
5	MCQ	GA	Α	1
6	MCQ	GA	D	2
7	MCQ	GA	Α	2
8	MCQ	GA	С	2
9	MCQ	GA	В	2
10	MCQ	GA	Α	2
1	MCQ	AR	С	1
2	MCQ	AR	D	1
3	MCQ	AR	Α	1
4	MCQ	AR	А	1
5	MCQ	AR	В	1
6	MCQ	AR	Α	1
7	MCQ	AR	В	1
8	MCQ	AR	В	1
9	MCQ	AR	А	1
10	MCQ	AR	С	1
11	MCQ	AR	В	1
12	MCQ	AR	D	1
13	MCQ	AR	В	1
14	MCQ	AR	А	1
15	MCQ	AR	D	1
16	MCQ	AR	MTA	1
17	MCQ	AR	А	1
18	MCQ	AR	D	1
19	MCQ	AR	A ; C	1
20	MCQ	AR	A	1
21	MCQ	AR	В	1
22	MCQ	AR	С	1
23	MCQ	AR	D	1
24	NAT	AR	2.0 : 2.0	1
25	NAT	AR	4.15 : 4.30	1
26	MCQ	AR	С	2
27	MCQ	AR	D	2
28	MCQ	AR	С	2
29	MCQ	AR	В	2
30	MCQ	AR	С	2
31	MCQ	AR	А	2
32	MCQ	AR	В	2
33	MCQ	AR	А	2
34	MCQ	AR	D	2
35	MCQ	AR	С	2
36	MCQ	AR	В	2
37	MCQ	AR	D	2
38	MCQ	AR	D	2
39	MCQ	AR	С	2

40	NAT	AR	18 : 18	2
41	NAT	AR	40:40	2
42	NAT	AR	2.45 : 2.55	2
43	NAT	AR	18 : 18	2
44	NAT	AR	0.4 : 0.5	2
45	NAT	AR	1812 : 1812	2
46	NAT	AR	16 : 16	2
47	NAT	AR	4:4	2
48	NAT	AR	585 : 595	2
49	NAT	AR	8:8	2
50	NAT	AR	1.2 : 1.3	2
51	NAT	AR	5:5	2
52	NAT	AR	36:36	2
53	NAT	AR	400 : 400	2
54	NAT	AR	5:5;10:10	2
55	NAT	AR	100 : 100	2

Q. 1 – Q. 5 carry one mark each.

Q.1 An apple costs Rs. 10. An onion costs Rs. 8.

Select the most suitable sentence with respect to grammar and usage.

- (A) The price of an apple is greater than an onion.
- (B) The price of an apple is more than onion.
- (C) The price of an apple is greater than that of an onion.
- (D) Apples are more costlier than onions.
- Q.2 The Buddha said, "Holding on to anger is like <u>grasping</u> a hot coal with the intent of throwing it at someone else; you are the one who gets burnt."

Select the word below which is closest in meaning to the word underlined above.

- (A) burning (B) igniting (C) clutching (D) flinging
- Q.3 **M** has a son **Q** and a daughter **R**. He has no other children. **E** is the mother of **P** and daughter-inlaw of **M**. How is **P** related to **M**?
 - (A) **P** is the son-in-law of **M**. (B) **P** is the grandchild of **M**.
 - (C) **P** is the daughter-in law of **M**. (D) **P** is the grandfather of **M**.

Q.4 The number that least fits this set: (324, 441, 97 and 64) is _____.

- (A) 324 (B) 441 (C) 97 (D) 64
- Q.5 It takes 10 s and 15 s, respectively, for two trains travelling at different constant speeds to completely pass a telegraph post. The length of the first train is 120 m and that of the second train is 150 m. The magnitude of the difference in the speeds of the two trains (in m/s) is _____.
 - (A) 2.0 (B) 10.0 (C) 12.0 (D) 22.0

Q. 6 – Q. 10 carry two marks each.

Q.6 The velocity V of a vehicle along a straight line is measured in m/s and plotted as shown with respect to time in seconds. At the end of the 7 seconds, how much will the odometer reading increase by (in m)?



Q.7 The overwhelming number of people infected with rabies in India has been flagged by the World Health Organization as a source of concern. It is estimated that inoculating 70% of pets and stray dogs against rabies can lead to a significant reduction in the number of people infected with rabies.

Which of the following can be logically inferred from the above sentences?

- (A) The number of people in India infected with rabies is high.
- (B) The number of people in other parts of the world who are infected with rabies is low.
- (C) Rabies can be eradicated in India by vaccinating 70% of stray dogs.
- (D) Stray dogs are the main source of rabies worldwide.
- Q.8 A flat is shared by four first year undergraduate students. They agreed to allow the oldest of them to enjoy some extra space in the flat. Manu is two months older than Sravan, who is three months younger than Trideep. Pavan is one month older than Sravan. Who should occupy the extra space in the flat?

	(A) Manu	(B) Sravan	(C) Trideep	(D) Pavan
Q.9	Find the area bour	nded by the lines 3x+2y	=14, 2x-3y=5 in the first	quadrant.
	(A) 14.95	(B) 15.25	(C) 15.70	(D) 20.35

- Q.10 A straight line is fit to a data set (ln x, y). This line intercepts the abscissa at ln x = 0.1 and has a slope of -0.02. What is the value of y at x = 5 from the fit?
 - (A) -0.030 (B) -0.014 (C) 0.014 (D) 0.030

END OF THE QUESTION PAPER

Q. 1 – Q. 25 carry one mark each.

Q.1	'Dharahara' refers to				
	(A) Concept of Vastu(B) Elevation feature(C) Heritage tower at(D) Construction methods	Shastra of a Hindu Temple Kathmandu nod of Buddhist Archited	cture		
Q.2	'Mushroom Column'	is a typical feature of			
	(A) Pantheon, Rome(C) Chrysler Building	, New York	(B) Parthenon, Athens(D) Johnson Wax Bui	s Iding, Racine	
Q.3	'AMRUT', the new so	cheme launched by Gov	ernment of India, stands	for	
	 (A) Atal Mission for I (B) Atal Mission for I (C) Atal Mission for I (D) Atal Mission for I 	Rejuvenation and Urban Renewal of Urban Trans Redevelopment of Urbar Renewal and Urban Trar	Transformation portation Transportation asformation		
Q.4	The concept of 'Dry C	Garden' is associated wit	th		
	(A) Japanese Garden	(B) Chinese Garden	(C) Mughal Garden	(D) Egyptian Garden	
Q.5	The concept of Transi	t Oriented Development	t (TOD) refers to		
	 (A) Transit oriented planning in institutional campuses (B) High density development along a mass transit corridor (C) Orienting residential blocks towards the transit in a gated community (D) Spatial design for persons with disabilities along a mass transit corridor 				
Q.6	The components meas	suring Human Developn	nent Index (HDI) of a na	tion are	
	 (A) Life expectancy, Education and Per Capita Income (B) Life expectancy, Economy and Housing (C) Health, Development and Per Capita Income (D) Housing, Health and Hygiene 				
Q.7	As per the Ancient Me 'prohibited area' beyo	onuments and Archaeolo and the 'demarcated prot	ogical Sites and Remains ected area' in meters is	Act, 2010, the extent of	
	(A) 50	(B) 100	(C) 200	(D) 500	
Q.8	In CMYK colour mod	lel, 'K' represents the co	blour		
	(A) White	(B) Black	(C) Blue	(D) Green	
Q.9	'Segregation at source	e' is a concept associated	l with		
	(A) Solid waste mana,(C) Traffic management	gement ent	(B) Disaster managem(D) Water management	nent nt	
Q.10	In a flat slab, the load	is transferred through			
	(A) Beam action		(B) Membrane action		
	(C) Plate action		(D) Vector action		

Q.11	Map is an					
	(A) Isometric projection(C) Axonometric projection		(B) Orthographic projection(D) Oblique projection			
Q.12	'Indore Slum Networking Programme' has been planned by					
	(A) B. V. Doshi (C) Anil Laul		(B) Dulal Mukherjee (D) Himanshu Parikh			
Q.13	'Volume Zero' is a fi	Im based on the architec	tural works of			
	(A) Peter Eisenman(C) Daniel Libeskind		(B) Charles Correa(D) Roger Angers			
Q.14	The unit of Thermal	Conductivity of a materia	al is			
	(A) W/(m K) (C) m K/W		(B) W/(m ² K) (D) m ² K/W			
Q.15	A semicircular niche	in the wall of a mosque,	towards the direction of	Mecca is known as		
	(A) Sahn	(B) Minbar	(C) Qibla	(D) Mihrab		
Q.16	As per CPWD Guide turning radius for a w	lines and Space Standard	ds for Barrier Free Built	Environment, the minimum		
	(A) 900	(B) 1200	(C) 1500	(D) 1800		
Q.17	'Summit Curve' is a	term associated with the	design of			
	(A) Roads and flyove (C) Tensile fabric str	ers uctures	(B) Escalators and elevators(D) Geodesic domes			
Q.18	As per Census of Ind	ia 2011, Nagar Panchaya	at refers to			
	 (A) Rural area surrounded by a growing city (B) Urban area within a panchayat (C) Rural area adjacent to a nagar (D) Urban area with a statutory local government 					
Q.19	Statutory setback of a	a building depends on				
	(A) Building height(C) Width of access r	oad	(B) Property boundary(D) Ground coverage	у		
Q.20	Super plasticizer is a	dded in a concrete mix to)			
	(A) Reduce the water(B) Increase the water(C) Reduce the flow(D) Reduce the conter	-cement ratio for a giver r-cement ratio for a give nt of coarse aggregate	n workability n workability			
Q.21	Shodhan House, Ahn	nedabad was designed by	ý			
	(A) Anant Raje (C) Louis I. Kahn		(B) Le Corbusier(D) B. V. Doshi			

Q.22	Low-emissivity coating on a glazing unit			
	(A) Increases the SHG(C) Reduces the SHGC	C	(B) Increases the VLT(D) Increases the VLT	and SHGC
Q.23	Spatial connectedness	in GIS refers to		
	(A) Tomography	(B) Topography	(C) Topiary	(D) Topology

- Q.24 In a residential neighbourhood, the net area of residential plots is 50 percent of the total area. If the population is 8000, the ratio of net density to gross density of the neighbourhood is _____
- Q.25 A hemispherical earth mound of 3 meter diameter is proposed to be constructed in a children's park. If the proportion of soil and sand for the construction is 3:2, the estimated volume of soil in cubic meters is _____

Q. 26 – Q. 55 carry two marks each.

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Q.26	Match the ancient cities	in Group -J	with their	characteristic	features in	Group-II
· · ·						

	Group-I	Group-II	
Р	Mohen-jo-daro	1 Agora	
Q	Babylon	2 Enclosed C	ourt
R	Kahun	3 Grid Iron S	treet Pattern
S	Athens	4 Forum	
		5 Hanging Ga	arden
(A) P	P-3, Q-4, R-2, S-5	(B) P-4, Q-5, R-1	, S-2
(C) P	P-3, Q-5, R-2, S-1	(D) P-4, Q-5, R-2	, S-3

Q.27 Match the water purification stages in Group-I with the corresponding items in Group-II

	Group-I	Group-II	
Р	Coagulation	1 Ammonium hydroxi	de
Q	Filtration	2 Sodium Zeolite	
R	Disinfection	3 Alum	
S	Softening	4 Sand	
		5 Chlorine	
(A)	P-3, Q-4, R-1, S-5	(B) P-1, Q-4, R-3, S-2	
(C) 1	P-2, Q-3, R-5, S-4	(D) P-3, Q-4, R-5, S-2	

Q.28 Match the software tools in Group-I with their field of application in Group-II

	Group-I	Group-II	
P O	Radiance	1 Outdoor thermal environme 2 Construction management	ent
R	Rayman	3 Air-flow analysis	
S	Primavera	4 Acoustical design5 Lighting analysis	
(A) P (C) P	2-3, Q-4, R-5, S-1 -5, Q-4, R-1, S-2	(B) P-5, Q-3, R-1, S-2 (D) P-4, Q-1, R-2, S-5	

Q.29 Match the street layouts of ancient Indian settlements in **Group – I** with their corresponding types in **Group – II**



Q.31 Hoop and meridional forces are associated with

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

(A) Dome	(B) Truss
(C) Folded Plate	(D) Space Frame

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

Q.30

Q.32 Match the Olympic stadia in Group-I with their Architects in Group-II

	Group-I		Group-II
Р	Palazzetto dello Sport, Rome	1	Herzog & de Meuron
Q	Olympic Arena, Tokyo	2	Frei Otto
R	Bird's Nest, Beijing	3	Kenzo Tange
S	Olympia Stadion, Munich	4	Roger Taillibert
		5	P. L. Nervi
(A) P	-5, Q-2, R-1, S-4	(B) I	P-5, Q-3, R-1, S-2
(C) P-	-2, Q-1, R-4, S-5	(D) l	P-2, Q-4, R-1, S-3

Q.33 Match the terms in Group-I with the related terms in Group-II

	Group-I	Group-II	
Р	Acquisition	1 Ownership	
Q	Planning permission	2 Construction	
R	Building plan sanction	3 Land cover	
S	Mutation	4 Land use	
		5 Land	
(A) P	2-5, Q-4, R-2, S-1	(B) P-5, Q-3, R-1, S-2	
(C) P	-3, Q-4, R-5, S-1	(D) P-5, Q-3, R-2, S-4	

Q.34 Associate the structural systems of Group-I with buildings in Group-II

	Group-I	G	roup-II
Р	Diagrid	1 M	illennium Dome, London
Q	Outrigger truss	2 H	SBC, Hong Kong
R	Suspended floor	3 Ta	aipei 101, Taipei
S	Cable stayed	4 He	earst Tower, New York
		5 Se	ears Tower, Chicago
(A) P	-1, Q-2, R-3, S-5	(B) P-5,	Q-3, R-4, S-1
(C) P-	-4, Q-2, R-3, S-1	(D) P-4,	Q-3, R-2, S-1

Q.35 Associate the systems in **Group-I** with their applications in **Group-II**

	Group-I		Group-II	
Р	Nisargruna	1	Renewable energy generation	
Q	Vortex-DEWAT	2	Ground water recharge	
R	Swale	3	Solid waste management	
S	BIPV	4	Desalination	
		5	Waste water treatment	
(A) P	P-4, Q-1, R-5, S-3	(B)	P-1, Q-2, R-5, S-4	
(C) P-3, Q-5, R-2, S-1		(D)	(D) P-5, Q-4, R-2, S-1	

Q.36 Match the Houses in Group-I with their Architects in Group-II

	Group-I		Group-II
Р	Villa Müller, Prague	1	Frank Gehry
Q	Farnsworth House, Illinois	2	Frank Lloyd Wright
R	Schröder House, Utrecht	3	Adolf Loos
S	Dancing House, Prague	4	Mies van der Rohe
		5	Gerrit Rietveld
(A) P	P-5, Q-2, R-4, S-1	(B)	P-3, Q-4, R-5, S-1
(C) P	2-3, Q-2, R-5, S-4	(D)	P-5, Q-4, R-2, S-3

Q.37 Match the Books in Group-I with their Authors in Group-II

	Group-I		Group-II
Р	Space, Time and Architecture	1	Bill Hillier
Q	The Social Logic of Space	2	Christopher Alexander
R	Timeless Way of Building	3	Rob Krier
S	Form, Space and Order	4	Sigfried Gideon
		5	Francis D. K. Ching
(A) P	2-3, Q-4, R-1, S-5	(B)) P-4, Q-3, R-1, S-2
(C) P-5, Q-4, R-2, S-3		(D) P-4, Q-1, R-2, S-5

Q.38 Associate the green rating system in Group-I with the respective country in Group-II

Group-I		Group-II
CASBEE	1	UAE
Green Mark	2	China
GRIHA	3	Japan
Estidama	4	Singapore
	5	India
, Q-4, R-5, S-1	(B) P	-4, Q-1, R-5, S-2
, Q-5, R-1, S-2	(D) P	P-3, Q-4, R-5, S-1
	Group-I CASBEE Green Mark GRIHA Estidama , Q-4, R-5, S-1 , Q-5, R-1, S-2	Group-I CASBEE 1 Green Mark 2 GRIHA 3 Estidama 4 5 , Q-4, R-5, S-1 (B) P , Q-5, R-1, S-2 (D) F

Q.39 Match the instruments in Group-I with the corresponding usage in Group-II

	Group-I	Group-II
Р	Pyranometer	1 Shadow analysis
Q	Heliodon	2 Seismic intensity
R	Total Station	3 Wind velocity
S	Anemometer	4 Solar radiation
		5 Land survey
(A) P	P-2, Q-1, R-5, S-3	(B) P-4, Q-3, R-1, S-2
(C) P	P-4, Q-1, R-5, S-3	(D) P-1, Q-4, R-2, S-3

Q.40 As per URDPFI guidelines, the number of Equivalent Car Space (ECS) required to accommodate ten cars, sixteen scooters and forty bicycles will be_____

- Q.41 A steel I-beam section is subjected to a bending moment of 96 kN-m. The moment of inertia of the beam section is 24,000 cm⁴. The bending stress at 100 mm above the neutral axis of the beam in MPa will be ______
- Q.42 A room is mechanically ventilated through four air-conditioning ducts. The opening area of each duct is 0.35 sqm. The air velocity in the duct is 0.5 m/s. The temperature difference between the ambient air and supply air is 10 °C. Volumetric specific heat of air is 1250 J/m³ °C. Assuming one Ton of refrigeration (TR) equals 3.5 kW, the cooling load of the room in TR will be

Q.43 A CPM network of a construction project is given in the figure below. The activity durations are mentioned in weeks. The project completion time in weeks will be ______



Q.44 For a room with dimensions $4m \times 3m \times 3m (L \times B \times H)$, the details of indoor acoustical treatment are as follows.

Component	Wall		Ceiling		Floor
Percentage area	30	70	40	60	100
Absorption coefficient at 1000 Hz	0.4	0.1	0.6	0.1	0.1

The reverberation time in seconds at 1000 Hz is _____

- Q.45 In 2001, the population and work force participation rate of a town were 30,000 and 30 percent respectively. The work force participation rate in the year 2011 increased to 34 percent. If the decadal population growth rate was 6 percent, the increase in the number of working people in the town in 2011 was ______
- Q.46 In a 20 storey building with 3m floor to floor height, a passenger lift is hoisted by a steel rope. Weight of the lift car is 750 kg and ultimate load the steel rope can carry is 39,000 kg. Assuming a factor of safety of 20 for the steel rope and an average passenger weight of 75 kg, the passenger capacity of the lift is ______
- Q.47 One litre of acrylic paint can cover 16 sqm of wall area for the first coat and 24 sqm for the second coat. The walls of a lecture hall measuring $12m \times 8m \times 4m$ (L × B × H) need to be painted with two coats of this paint. The hall has total glazed fenestration area of 12 sqm. The number of 4 litre paint containers required will be _____
- Q.48 A 250 mm × 250 mm RCC column is reinforced with one percent steel. The permissible compressive stress of concrete and steel are 8 N/mm² and 150 N/mm² respectively. The axial load carrying capacity of the column in kN is ______
- Q.49 A solar photo-voltaic system is proposed to be installed at the roof top of a hostel. The cost of installation and the annual maintenance are INR 2,40,000 and INR 6000 respectively. It is expected to generate 600 kWh of electricity per month. Assume unit price of electricity as INR 5. Ignoring the discount rate, the payback period of the investment in years is______
- Q.50 A pump is installed in an apartment building to lift water from ground level to the roof top water tank with the capacity of 10,000 litres. Total head of lift is 18 m and pumping time is 30 minutes to fill the tank completely. Assuming acceleration due to gravity (g) as 10 m/sec² and efficiency of the pump as 80 percent, the power requirement of the pump in kW will be ______

- Q.51 In a housing project, the number of LIG, MIG and HIG units are in the ratio of 1:1:2. The ratio of areas of the units is 3:5:8. Assume unit cost of construction is same for all the three types. For a no profit no loss situation, if 10% discount is offered to LIG and MIG units on sale price, extra charge in percentage payable per HIG unit will be _____
- Q.52 The estimated number of bricks (unit size: 250 mm × 125 mm × 75 mm) for laying one course of a 250 mm thick brick wall using rat-trap bond for a running length of 3.9 meter will be _____
- Q.53 The difference in invert levels between two pits separated by a distance of 30 meter is one meter. An intermediate pit is required to be constructed at a distance of 18 meter from the pit at higher level. Maintaining the same slope, the difference in invert levels of the new pit and the pit at lower level in mm will be _____
- Q.54 A four-storey building with equal areas in each floor is required to be designed on a plot with FAR of 2.0. If the FAR is increased to 2.2, the percentage increase in ground coverage utilizing full FAR in both cases will be ______
- Q.55 A lamp source of 3200 candela is mounted on a wall at a height of 2 meter from the work-plane. It subtends an angle of incidence of 60° with the center of the work plane. The illumination at the centre of the work plane in Lux is _____

END OF THE QUESTION PAPER

Q. No	Туре	Section	Кеу	Marks
1	MCQ	GA	С	1
2	MCQ	GA	С	1
3	MCQ	GA	В	1
4	MCQ	GA	С	1
5	MCQ	GA	А	1
6	MCQ	GA	D	2
7	MCQ	GA	А	2
8	MCQ	GA	С	2
9	MCQ	GA	В	2
10	MCQ	GA	Α	2
1	MCQ	AR	С	1
2	MCQ	AR	D	1
3	MCQ	AR	А	1
4	MCQ	AR	Α	1
5	MCQ	AR	В	1
6	MCQ	AR	Α	1
7	MCQ	AR	В	1
8	MCQ	AR	В	1
9	MCQ	AR	А	1
10	MCQ	AR	С	1
11	MCQ	AR	В	1
12	MCQ	AR	D	1
13	MCQ	AR	В	1
14	MCQ	AR	А	1
15	MCQ	AR	D	1
16	MCQ	AR	А	1
17	MCQ	AR	А	1
18	MCQ	AR	D	1
19	MCQ	AR	Α	1
20	MCQ	AR	А	1
21	MCQ	AR	В	1
22	MCQ	AR	С	1
23	MCQ	AR	D	1
24	NAT	AR	2.0:2.0	1
25	NAT	AR	4.15 : 4.30	1
26	MCQ	AR	С	2
27	MCQ	AR	D	2
28	MCQ	AR	С	2
29	MCQ	AR	В	2
30	MCQ	AR	С	2
31	MCQ	AR	А	2
32	MCQ	AR	В	2
33	MCQ	AR	А	2
34	MCQ	AR	D	2
35	MCQ	AR	С	2
36	MCQ	AR	В	2
37	MCQ	AR	D	2
38	MCQ	AR	D	2
39	MCQ	AR	С	2

40	NAT	AR	18 : 18	2
41	NAT	AR	40:40	2
42	NAT	AR	2.45 : 2.55	2
43	NAT	AR	18 : 18	2
44	NAT	AR	0.44 : 0.46	2
45	NAT	AR	1812 : 1812	2
46	NAT	AR	16 : 16	2
47	NAT	AR	4:4	2
48	NAT	AR	585 : 595	2
49	NAT	AR	8:8	2
50	NAT	AR	1.2 : 1.3	2
51	NAT	AR	5:5	2
52	NAT	AR	36 : 36	2
53	NAT	AR	400 : 400	2
54	NAT	AR	5:5;10:10	2
55	NAT	AR	100 : 100	2