

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS: MUP  
BRANCH: ARCHITECTURE AND PLANNING**

**SEMESTER : I  
SESSION : MO/2024**

**SUBJECT: AR609 URBAN INFRASTRUCTURE PLANNING**

**TIME: 3 Hours**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
- 

		CO	BL
Q.1(a)	Identify and explain the various components of 'Physical Infrastructure'.	[5] 1	1
Q.1(b)	Explain the role of CPHEEO in the development of urban infrastructure projects.	[5] 2	3
Q.2(a)	Explain with the help of a flowchart, the treatment process of turbid surface water with organics for a metropolitan city.	[5] 2	2
Q.2(b)	Settlement houses a population of 4,000 stretched over 2.5 kms having a population density of 200 persons per acre. Calculate- (i) the diameter of the water supply pipe and (ii) the height of the overhead water reservoir, making required considerations so that water may be supplied at the same rate to all parts. The type of distribution system and the related data may be suitably assumed. Assume the following: water demand= 150 lpcd, water supplied 2 times for 2 hours daily, velocity of water in pipes= 0.9 m/sec, minimum pressure= 15.0 N/cm <sup>2</sup> gravitational constant=9.81 m/sec <sup>2</sup> frictional coefficient =0.01 Density of water= 9810 N/m <sup>3</sup>	[5] 4	5
Q.3(a)	Write a short note on the 'oxidation lagoon' with reference to the wastewater treatment process.	[5] 2	2
Q.3(b)	Explain the wastewater treatment process (Activated Sludge method) for a large size city, with the help of a proper flow diagram.	[5] 2	3
Q.4(a)	Discuss the various functional elements associated with the solid waste management of a city.	[5] 2	2
Q.4(b)	Discuss any two methods of land filling adopted for the treatment of the solid waste generated at a city level.	[5] 3	4
Q.5(a)	Discuss the basic approach to general distribution of electric power in towns and cities.	[5] 2	2
Q.5(b)	Calculate the average spacing of streetlights of average lux 5, having illumination of 600 lumen, for a road with a crown, having right of way width of 12m, for a mounting height of 9.5m. Assume the value of coefficient of utilization= 0.45 and maintenance factor= 0.75.	[5] 4	5

:22/11/2024:E