

**P.E.S. College of Engineering, Mandya - 571 401***(An Autonomous Institution affiliated to VTU, Belagavi)***Seventh Semester, B.E. - Civil Engineering****Semester End Examination; February - 2022****Building Services**

Time: 3 hrs

Max. Marks: 100

**Course Outcomes***The Students will be able to:**CO1: Prepare the design factors for providing ventilation, thermal comfort & in construction of buildings.**CO2: Interpret the knowledge of design factors of electric and fire protection in building construction.**CO3: Prepare the design factors for providing illumination, acoustics and noise control construction of buildings.**CO4: Choose & suggest type of elevators & escalators based on working principle & design principles.***Note: I) PART - A is compulsory. Two marks for each question.****II) PART - B: Answer any Two sub questions (from a, b, c) for Maximum of 18 marks from each unit.**

Q. No.	Questions	Marks	BLs	COs	POs
<b>I : PART - A</b>		<b>10</b>			
I a.	List any four factors affecting thermal comfort in buildings.	2	L1	CO1	PO1,2,3
b.	Mention any four characteristics of a good fire resisting material.	2	L1	CO2	PO1,3,12
c.	List the principles of Illumination.	2	L1	CO3	PO3,12
d.	Mention the components of typical elevators.	2	L1	CO4	PO1,12,2
e.	Explain zero energy buildings and green building.	2	L1	CO4	PO1,12,2
<b>II : PART - B</b>		<b>90</b>			
<b>UNIT - I</b>		<b>18</b>			
1 a.	Define Ventilation. Briefly explain the requirements of good Ventilation.	9	L2	CO1	PO1,2,3
b.	Discuss the necessity of sound amplification and also explain the mechanism of sound amplification.	9		CO1	PO1,2,3
c.	List and explain the different types of thermal insulating materials.	9		CO1	PO1,2,3
<b>UNIT - II</b>		<b>18</b>			
2 a.	Briefly explain the system of wiring for domestic and commercial buildings.	9		CO2	PO1,3,12
b.	Briefly explain the necessity of fire protection. Write a note on fire protection equipment.	9		CO2	PO1,3,12
c.	Explain the fire resistant construction for;	9		CO2	PO1,3,12
	i) Floors and Roofs                      ii) Walls and Columns				
<b>UNIT - III</b>		<b>18</b>			
3 a.	Write a note on;				
	i) Artificial lighting	9		CO3	PO3,12
	ii) Day lighting				
	iii) Flood lighting				

b. Define Illumination. List and explain various types of lamps.	9	CO3 PO3,12
c. Define Acoustics. Briefly explain the acoustical defects and remedies.	9	CO3 PO3,12
<b>UNIT - IV</b>		<b>18</b>
4 a. What is sound insulation? Briefly explain horizontal barriers and vertical barriers with respect to sound insulation.	9	CO4 PO1,2,12
b. Briefly explain the working principle of elevators and escalators.	9	CO4 PO1,2,12
c. List and explain the components of a typical elevator and escalators.	9	CO4 PO1,2,12
<b>UNIT - V</b>		<b>18</b>
5 a. List out the advantages of zero energy building and green building.	9	CO4 PO1,2,12
b. Write a note on passive solar design technique.	9	CO4 PO1,2,12
c. Write a note on;		
i) Thermal storage	9	CO4 PO1,2,12
ii) Cooling strategies		
iii) High performance insulation		

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