



MANGALORE INSTITUTE OF TECHNOLOGY & ENGINEERING

(A Unit of Rajalaxmi Education Trust®, Mangalore)

Autonomous Institute affiliated to VTU, Belagavi, Approved by AICTE, New Delhi

Accredited by NAAC with A+ Grade & ISO 9001:2015 Certified Institution

Model Question Paper

First/Second Semester B.E Degree Examination 2026-27

Civil Engineering & Sustainable Infrastructure

Time: 2.5 Hours (150 Minutes)

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M: Marks, L: RBT (Revised Bloom's Taxonomy) level, C: Course outcomes.

Module -1			M	L	C
Q1	a.	Explain the brief history of Civil Engineering.	06	2	1
	b.	Explain the functions of foundation, plinth and lintel in a building.	04	2	1
	c.	A residential plot measures 30 m × 20 m. The local building byelaws permit a Floor Area Ratio of 1.8 and maximum ground coverage of 60%. Make use of these provisions to find: i) the maximum permissible total built-up area, ii) the maximum permissible ground floor area iii) the maximum number of floors that can be constructed with equal floor areas,	10	3	1
OR					
Q2	a.	Explain any five roles of a Civil Engineer in the infrastructural development of the nation.	06	2	1
	b.	Explain the significance of cement and steel as building materials.	04	2	1
	c.	Choose the most suitable building material or structural element for each of the following site situations in a residential building, and identify its significance: i) Moisture from the ground is rising into the ground floor walls. ii) Doors and windows on the outer walls need protection from rain and direct sunlight. iii) Bricks of the external walls are to be bonded together iv) A leveling bed is required below the footing. v) Low-cost walls are to be built using site soil without kiln firing.	10	3	1
Module- 2					
Q3	a.	Illustrate the architecture of a Digital Twin for a building with a neat block diagram.	06	2	2
	b.	Outline the different dimensions of Building Information Modeling.	04	2	2
	c.	Explain the strategic planning for Digital Twin implementation in construction and outline its applications for building energy and carbon performance.	10	2	2
OR					
Q4	a.	Contrast Building Information Modeling and Digital Twins in construction.	06	2	2
	b.	Outline the evolution of modelling from manual drafting to object-based parametric modelling.	04	2	2
	c.	Explain the impact of BIM on project stakeholders.	10	2	2
Module - 3					
Q5	a.	Classify the system of forces with neat sketches.	10	2	3

	b.	Solve for the magnitude and direction of the resultant of the coplanar concurrent force system shown in Fig. 5(b).			
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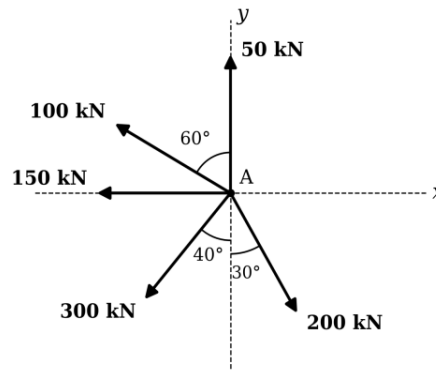


Fig. 5(b)

OR

	a.	Explain the following with neat sketches: i) Principle of transmissibility of forces ii) Principle of physical independence of forces iii) Principle of superposition of forces	10	2	3
Q6	b.	Solve for the magnitude and direction of the resultant of the coplanar concurrent force system shown in Fig. 6(b).	10	3	3

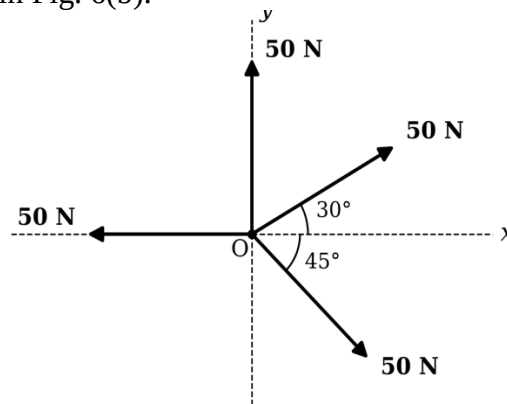


Fig. 6(b)

Module - 4

	a.	Explain the importance and characteristics of sustainable infrastructure.	06	2	4
Q7	b.	Outline the role of sustainable infrastructure in the sustainable development of a country.	04	2	4
	c.	Compare the sustainable practices adopted in urban and rural infrastructure with suitable examples.	10	2	4

OR

	a.	Explain the concept and significance of embodied energy.	06	2	4
Q8	b.	Outline the role of embodied energy in assessing the sustainability of infrastructure.	04	2	4
	c.	Illustrate the three principles of sustainable infrastructure – resource efficiency, resilience and life cycle assessment with suitable examples.	10	2	4

Module - 5

	a.	Explain the necessity and features of green buildings.	06	2	4
Q9	b.	Explain the health and social benefits of green buildings.	04	2	4
	c.	Explain the GRIHA rating system for new buildings with reference to its purpose, key highlights and point system with differential weightage.	10	2	4

OR

Q10	a.	Explain the environmental and economic benefits of green buildings.	06	2	4
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	b.	Explain the concept and need for energy efficiency in buildings.	04	2	4
	c.	Compare passive and active design strategies for energy performance in green buildings with suitable examples.	10	2	4
