

Register No.: ..... Name: .....

## SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER B.TECH DEGREE EXAMINATION (Special), AUGUST 2021

Course Code: 20EST120

Course Name: Basics of Civil and Mechanical Engineering

Max. Marks: 100

Duration: 3 Hours

### PART I BASIC CIVIL ENGINEERING

*Part I to be answered in pages 1 to 15*

#### PART A

*(Answer all questions. Each question carries 4 marks)*

- |   | <b>CO</b> |
|---|-----------|
| 1. In what way Civil Engineers play a vital role in nation building.  | [1]       |
| 2. Explain the term plinth area, floor area and floor area ratio.     | [2]       |
| 3. What are the objectives of surveying?                              | [3]       |
| 4. Differentiate between load bearing structure and framed structure. | [2]       |
| 5. What is HVAC system?   | [4]       |

#### PART B

*(Answer one full question from each module, each question carries 10 marks)*

#### MODULE I

- |   | <b>CO</b> | <b>Marks</b> |
|---|-----------|--------------|
| 6. a) Briefly explain the major disciplines of civil engineering.               | [1]       | (5)          |
| b) Write short note on the features of Group A and Group C building as per NBC. | [2]       | (5)          |

#### OR

- |   | <b>CO</b> | <b>Marks</b> |
|---|-----------|--------------|
| 7. a) With a neat sketch, describe the components of a building.  | [2]       | (5)          |
| b) What is the role of KBR and CRZ norms in building regulations? | [2]       | (5)          |

#### MODULE II

- |  | <b>CO</b> | <b>Marks</b> |
|--|-----------|--------------|
| 8. a) What are the requirements of good building stones?             | [2]       | (5)          |
| b) Explain in detail the physical and chemical properties of cement. | [2]       | (5)          |

OR

		<b>CO</b>	<b>Marks</b>
9.	a) Explain the various stages of manufacture of concrete.	[2]	(5)
	b) What are the properties and modern uses of gypsum?	[4]	(5)

**MODULE III**

		<b>CO</b>	<b>Marks</b>
10.	a) Distinguish between English bond and Flemish bond with neat sketches.	[2]	(5)
	b) Explain the different types of flooring.	[2]	(5)

OR

		<b>CO</b>	<b>Marks</b>
11.	a) What are the factors to be considered while designing an elevator?	[4]	(5)
	b) Explain the concept of green buildings.	[5]	(5)

**PART II BASIC MECHANICAL ENGINEERING***Part II to be answered in pages 16 to 30***PART A***(Answer all questions. Each question carries 4 marks)*

		<b>CO</b>	<b>Marks</b>
12.	A Carnot engine does 40 Joule of work and rejects 20 Joule of work during each cycle. If the cold reservoir temperature is 15°C. What is the minimum possible temperature in degree Celsius?	[6]	[4]
13.	Enumerate any four difference of spark and compression ignition engines.	[7]	[4]
14.	Define the COP of refrigerator and Pump using simple schematic diagram.	[8]	[4]
15.	What is meant by slip in belt drive? Comment its effect on velocity ratio?	[10]	[4]
16.	What are the steps involved in sand casting?	[11]	[4]

**PART B***(Answer one full question from each module, each question carries 10 marks)***MODULE IV**

		<b>CO</b>	<b>Marks</b>
17.	The compression ratio of an ideal air standard diesel cycle is 15. The heat transfer is 1465KJ/kg of air. Find the pressure and temperature at the end of each process and determine the cycle efficiency	[6]	(10)

OR

- |   | <b>CO</b> | <b>Marks</b> |
|---|-----------|--------------|
| 18. Explain the working of a 2 stroke SI engine with neat sketches. | [7]       | (10)         |

**MODULE V**

- |  | <b>CO</b> | <b>Marks</b> |
|--|-----------|--------------|
| 19. A gear B drives a gear C externally. The gear C, in turn, drives an internal gear D. The number of teeth in the three gears B, C and D are 25, 75 and 125 respectively. What is the speed and direction of rotation of the gear D, if gear B rotates anticlockwise at 100 r p m. | [10]      | (10)         |

OR

- |  | <b>CO</b> | <b>Marks</b> |
|--|-----------|--------------|
| 20. a) Distinguish between impulse and reaction turbines.        | [9]       | (4)          |
| b) Explain the working of reciprocating pump with neat sketches. | [9]       | (6)          |

**MODULE VI**

- |  | <b>CO</b> | <b>Marks</b> |
|--|-----------|--------------|
| 21. Describe working parts of a radial drilling machine with neat block diagram. | [11]      | (10)         |

OR

- |   | <b>CO</b> | <b>Marks</b> |
|---|-----------|--------------|
| 22. a) Distinguish between arc and gas welding  | [11]      | (5)          |
| b) Explain at least two types of rolling mills. | [11]      | (5)          |

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