

Roll No



**PRESIDENCY UNIVERSITY
BENGALURU**

SET-A

**SCHOOL OF ENGINEERING
END TERM EXAMINATION – MAY/JUNE 2024**

Semester : Semester II - 2023

Course Code : CIV1008

Course Name : - Basic Engineering Sciences

Program : B.Tech.

Date : June 13, 2024

Time : 1:00 PM - 4:00 PM

Max Marks : 100

Weightage : 50%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

PART A

Answer any 10 questions

10*2M = 20M

1. What is Civil Engineering? List any two branches of Civil Engineering. (CO1) [Knowledge]
2. List the physical water quality parameters. (CO1) [Knowledge]
3. List any four surface sources of water. (CO1) [Knowledge]
4. List any two importance of bridges. (CO1) [Knowledge]
5. Define mechanization and give one example of mechanization in construction. (CO2) [Knowledge]
6. List any four digital technologies/tools used in the construction industry. (CO2) [Knowledge]
7. List any two components of Smart Mobility system. (CO2) [Knowledge]
8. What is coalification? (CO3) [Knowledge]
9. What is Energy? And mention the law of conservation of energy. (CO3) [Knowledge]

10. Why we are unable to fulfill all our electricity need from renewable energy? (CO3) [Knowledge]
11. List the conventional manufacturing process. (CO3) [Knowledge]
12. What is the function of pump? (CO4) [Knowledge]
13. What is heat engine? (CO4) [Knowledge]
14. What health issues are caused due to utilization of Non-renewable energy resources? (CO4) [Knowledge]

PART B

Answer any 8 questions

8*5M = 40M

15. Irrigation is the science of artificial application of water to the agricultural field in accordance with crop requirements throughout the period of growth for full maturity of crop. Write the advantages and disadvantages of Irrigation (CO1) [Comprehension]
16. Wastewater is liquid waste, often produced as the byproduct of many uses of water. Mention the sources of waste water and also list the impacts of waste water on environment (CO1) [Comprehension]
17. Railway engineering is a multi-faceted engineering discipline dealing with the design, construction and operation of all types of rail transport systems. Explain the functions of following components of a railway track
a) Sleepers b) Ballast (CO1) [Comprehension]
18. Smart city offers sustainability in terms of economic activities and employment opportunities to a wide section of its residents, regardless of their level of education, skills or income levels. Mention the key features/aspects of a smart city. (CO2) [Comprehension]
19. Smart mobility is a new way of thinking about transportation that is cleaner, safer, and more efficient. Mention the core objectives of smart mobility initiatives (CO2) [Comprehension]
20. Construction equipments are used in order to achieve larger output, cost-effective, execution of work that is not feasible by manual efforts, reduce the amount of heavy manual work which would cause fatigue, maintaining large output, and finalize projects on time. Mention the factors affecting selection of construction equipments (CO2) [Comprehension]
21. Industry growth refers to the expansion and development of a specific sector within the economy. Mention the progress of Industry 1, 2, 3 and 4. (CO3) [Comprehension]
22. Harnessing natural resources like solar, wind, and hydroelectric power to generate energy without depleting resources has become crucial in today's world. Write a brief note on Non-renewable energy sources with respect to energy harnessing. (CO3) [Comprehension]
23. Designing machines and systems that use energy more efficiently, reduces waste. Mention atleast five differences between Additive and Subtractive manufacturing process. (CO3) [Comprehension]

24. Determine the total electricity bill for a 30-day month based on the usage of the following devices: a) Four 30-watt bulbs operating for 5 hours daily, b) Four 50-watt tube lights in use for 8 hours daily, and c) Two 300-watt refrigerators running continuously for 24 hours. The electricity tariff is Rs. 3 per unit.
(CO4) [Comprehension]
25. Metal joining processes refer to methods used to connect or bond metal parts together. These processes are crucial in various industries such as manufacturing, construction, and automotive. Mention the differences between Soldering and Brazing Process.
(CO4) [Comprehension]
26. Casting molds are crucial elements in various casting techniques. Explain Metal casting process with a neat sketch.
(CO4) [Comprehension]

PART C

Answer any 4 questions

4*10M=40M

27. Structure is the assemblage of two or more basic elements such as beam, slab, column, truss etc. Explain the components of a structural building
(CO1) [Application]
28. Smart cities use intelligent solutions to optimize infrastructure and smart and responsive governance to engage citizens in the management of their city. Explain the following components of a smart city.
a) Smart Transportation and Mobility
b) Environmental harmony
(CO2) [Application]
29. Digital technology refers to the systems, hardware and processes that use digital data or signals to achieve a particular set of user-defined results. Explain the following concepts related to use of digital technology in construction.
a) Structural analysis and design tools
b) Applications of artificial Intelligence in construction
(CO2) [Application]
30. The deformation process involves altering the shape and size of materials, usually metals, through the application of external forces. Explain plastic deformation Processes with a neat sketch.
(CO3) [Application]
31. A machinist is using a high-speed steel (HSS) cutting tool to machine a piece of aluminum. For this particular tool and material, $n=0.3$ and $C=400C$. The machinist wants to find the cutting speed that will give a tool life of 60 minutes.
a) Calculate the cutting speed for a tool life of 60 minutes.
b) If the machinist increases the cutting speed by 20%, calculate the new tool life.
(CO4) [Application]
32. The primary goal of manufacturing is to produce goods efficiently, cost-effectively, and with consistent quality. Explain the working principle of electric arc welding, with a neat sketch.
(CO4) [Application]