

# P P SAVANI UNIVERSITY

First Semester of B. Tech. Examination  
January 2023

SECV1040 Basics of Civil & Mechanical Engineering

06.01.2023, Friday

Time: 10:00 a.m. To 12:30 p.m.

Maximum Marks: 60

## Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

## SECTION - I

- Q - 1 Answer the following. (Any Five) [05] CO BTL
- (i) The scope of civil engineering is 3,4 1
- (a) Planning, Designing and Estimating (b) Supervision of construction
- (c) Maintenance of work (d) All of the above
- (ii) The size of a modular brick is \_\_\_\_\_.
- (a) 19 x 9 x 9 cm (b) 19 x 19 x 19 cm
- (c) 19 x 19 x 9 cm (d) 9 x 9 x 9 cm
- (iii) The portion of the building which is above ground level is termed as \_\_\_\_\_.
- (a) Substructure (b) Superstructure (c) Subsoil (d) Subgrade
- (iv) In metric chain number of links per meter can be \_\_\_\_\_.
- (a) 2 (b) 5 (c) 4 (d) 8
- (v) Convert  $330^\circ$  WCB to RB.
- (vi) Staff reading taken on a benchmark or change point is known as \_\_\_\_\_.
- (a) Back sight (b) Intermediate sight
- (c) Fore sight (d) None of the above
- (vii) Earthquake-resisting building design depends on \_\_\_\_\_.
- (a) Shape of building (b) Size of building
- (c) Geometry of building (d) All of the above

- Q - 2 (a) The following bearings were taken of a closed traverse ABCD. Calculate the Interior [10] 3 4,5  
angles of the traverse.

Line	FB	BB
AB	$150^\circ 15'$	$330^\circ 15'$
BC	$20^\circ 30'$	$200^\circ 30'$
CD	$295^\circ 45'$	$115^\circ 45'$
DE	$218^\circ 00'$	$38^\circ 00'$
EA	$120^\circ 30'$	$300^\circ 30'$

OR

- Q - 2 (a) The following bearings were taken of a closed traverse ABCD. Calculate the Interior [10] 3 4,5  
angles of the traverse.

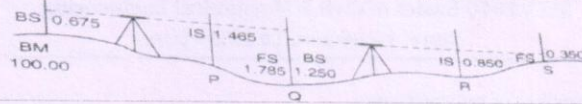
Line	FB	BB
AB	$N45^\circ 30'E$	$S45^\circ 30'W$
BC	$S60^\circ 00'E$	$N60^\circ 00'W$
CD	$S10^\circ 30'W$	$N10^\circ 30'E$
DA	$N875^\circ 45'$	$S75^\circ 45'E$

- Q - 3 (a) Explain various building components and their functions. [05] 4 1,2
- Q - 3 (b) Write a note on the characteristics of cement and list various types of cement. [05] 3 1



**OR**

- Q - 3 (a)** Explain various types of loads acting on Building [05] 4 1,2  
**Q - 3 (b)** The Consecutive readings were taken with a dumpy level along a chain line as presented in the figure. Calculate RL of all points and apply the usual check. [05] 3 4,5



- Q - 4** Attempt anyone. [05]  
**(i)** Explain Various branches of Civil Engineering in detail. 3 2  
**(ii)** Write a short note on various types of dams. 4 1

**SECTION - II**

- Q - 5** Answer following (Any Five) [05]  
**(i)** If the mass within the boundary of the system remains constant, it is called a \_\_\_\_\_ system. 1 1  
**(ii)** Thermoflask is an example of \_\_\_\_\_ System. 1 2  
**(iii)** Which of the following is the boiler accessories? 1 1  
 (a) Safety Valve (b) Stop Valve (c) Economiser (d) Blow-off cock  
**(iv)** Which of the following are boiler mountings? 1 1  
 (a) Economiser (b) Fusible plug (c) Super heater (d) injector  
**(v)** A two-stroke I.C engine has 1 1  
 (a) inlet and exhaust valves (b) inlet and exhaust port  
 (c) inlet, exhaust and transfer ports (d) only transfer ports  
**(vi)** Air/fuel ratio in petrol engine is controlled by 1 1  
 (a) governor (b) injector (c) carburetor (d) flywheel  
**(vii)** The type of clutch used in trucks and buses is 1 1  
 (a) single plate clutch (b) multi-plate clutch  
 (c) cone clutch (d) centrifugal clutch

- Q - 6 (a)** Define prime movers. Write any Four examples of the prime movers. [05] 1,2 1,2  
**Q - 6 (b)** What are the advantages and disadvantages of liquid fuels over solid fuels? [05] 1,2 2,3

**OR**

- Q - 6 (a)** Distinguish between coupling and clutch. How do you classify clutches? [05] 1,2 2  
**Q - 6 (b)** Describe briefly using neat diagrams the types of belt drives [05] 1,2 2  
**Q - 7 (a)** Describe the construction features of Cochran boiler. Discuss its working briefly. [07]  
**Q - 7 (b)** What is boiler mountings and why it's essential for boiler? [03] 1,2 1,2

**OR**

- Q - 7 (a)** Explain with help of neat labelled diagram, the working principle of any one type of I.C engine on basis of number of stroke. [07] 1,2 1,2  
**Q - 7 (b)** Define the following terms: [03] 1,2 1  
 (a) clearance volume (b) swept volume (c) compression ratio  
**Q - 8** Attempt any one. [05] 1,2 2,3  
**(i)** Explain the concept of temperature  
**(ii)** Explain difference between boiler mountings and accessories.

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CO : Course Outcome Number

BTL : Blooms Taxonomy Level

Level of Bloom's Revised Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

