

# P P SAVANI UNIVERSITY

First Semester of Diploma Examination

January 2022

IDME1010 Basics of Mechanical & Civil Engineering

27.01.2022, Thursday

Time: 12:30 p.m. To 03:00 p.m.

Maximum Marks: 60

## Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in same answer sheet.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is **NOT** allowed.

## SECTION - I

Q - 1 (a) Differentiate between hand tool vs power tool and also list any 5-hand tool and power tool. [05]

Q - 1 (b) Differentiate between SI. Engine vs C.I engine. [05]

OR

Q - 1 (a) Explain construction and working of any heat engine with neat sketch. [05]

Q - 1 (b) List out various mounting used in boiler and explain the function of any two mounting. [05]

Q - 2 (a) Explain the Cochran boiler with neat sketch. [05]

Q - 2 (b) Explain the single acting reciprocating pump with sketch. [05]

OR

Q - 2 (a) Explain the concept of water turbine with example of Hydro power plant. [05]

Q - 2 (b) What is coupling? List different types of couplings and explain any one in detail. [05]

Q - 3 (a) Differentiate between flat belt vs v-belt. [05]

Q - 3 (b) Explain the Arc welding process in detail. [05]

OR

Q - 3 (a) Give the brief classification of I.C engine. [05]

Q - 3 (b) Explain the gas welding process in detail. [05]

## SECTION - II

Q - 1 Answer any five of the Following: [05]

(i) Which of the following scale is the largest one?

(a) 1 cm = 5 m (b) 1 cm = 50 m (c) 1:10,000 (d) 1 cm = 5 km.

(ii) Which of the following instrument is inserted into ground after every chain length?

(a) Peg (b) Arrow (c) Ranging rod (d) Offset rod.

(iii) Concrete preferably used in manufacturing of railway sleepers, bridge girders, electric poles etc. is \_\_\_\_\_

(a) P.C.C. (b) R.C.C. (c) P.S.C. (d) P.C.

(iv) Error in reciprocal leveling is not completely eliminated due to \_\_\_\_\_

(a) Curvature (b) Refraction

(c) Non-adjustment line of collimation (d) Parallax.

(v) Initial setting time of cement is delay due to presence of \_\_\_\_\_

(a) CaCO<sub>3</sub> (b) CaO (c) CaSO<sub>4</sub> (d) Al<sub>2</sub>O<sub>3</sub>

(vi) A survey conducted to determine latitudes, longitudes, azimuths etc. for various places on the earth by observing heavenly body is \_\_\_\_\_

(a) Archeological survey (b) Aerial survey

(c) Astronomical survey (d) Geological survey.

(vii) A 100 ft long chain is a \_\_\_\_\_

(a) Gunter's chain (b) Revenue chain (c) Engineer's chain (d) Metric chain

- Q - 2 (a) Draw any ten different symbols which are used in Surveying. [05]  
Q - 2 (b) Enlist the material used in construction. Explain the requirement & properties of concrete. [05]

OR

- Q - 2 (a) Draw layout plan of any typical public building. [05]  
Q - 2 (b) Mention the qualities & properties of a good timber. [05]

- Q - 3 (a) Give the difference between whole circle bearing and reduced bearing method. [05]  
Q - 3 (b) Following are the bearings taken in a closed traverse. Compute interior angles and correct them for observational errors. [05]

| Line | F.B.    | B.B.    |
|------|---------|---------|
| AB   | 142°30' | 322°30' |
| BC   | 223°15' | 44°15'  |
| CD   | 287°00' | 107°45' |
| DE   | 12°45'  | 193°15' |
| EA   | 60°00'  | 239°00' |

OR

- Q - 3 (a) Explain the temporary adjustment of Dumpy level. [05]  
Q - 3 (b) Give Classification of surveying. Explain any one in detail. [05]

- Q - 4 Attempt any one of the following. [05]

(i) Enlist the various branches of Civil Engineering & explain importance of any one branch in detail.

(ii) Define the Representative Fraction scale with suitable example.

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