

Total No. of Questions : 12]

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[3761]-104

F. E. (Semester - I) Examination - 2010

BASIC CIVIL AND ENVIRONMENTAL ENGINEERING

(June 2008 Pattern)

Time : 3 Hours]

[Max. Marks : 100

Instructions :

- (1) Attempt Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6 from section I and Q. 7 or Q.8, Q.9 or Q. 10, Q. 11 or Q.12 from section II.
- (2) Answers to the **two sections** should be written in **separate books**.
- (3) Black figures to the right indicate full marks.
- (4) Neat diagrams must be drawn wherever necessary.
- (5) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
- (6) Assume suitable data, if necessary.

SECTION - I

- Q.1)** (A) 21st Century is the era of interdisciplinary engineering. Explain the statement. [06]
- (B) Write a brief note on following and give practical application : [06]
- (1) Environmental Engineering
 - (2) Geotechnical Engineering
- (C) Enlist and briefly explain the infrastructural facilities that are to be provided in a locality for its development. (Any 4). [04]

OR

- Q.2)** (A) Define the term 'GAUGE' and show this with the help of a sketch. Also, state the various types of gauges with their dimensions. [06]
- (B) Differentiate between the following w.r.t. any 3 points : [06]
- (1) Estimation and Valuation
 - (2) Flexible Pavement and Rigid Pavement
- (C) Enumerate the functions, a Civil Engineer has to perform in construction of dams. [04]

- Q.3)** (A) Write notes on : [06]
- (1) Raft Foundation
 - (2) Settlement of Foundation
- (B) Discuss how smart-materials can be used in construction ? [06]
- (C) What are Deep Foundations ? What is the difference between End Bearing Pile and Friction Pile ? [04]

OR

- Q.4)** (A) What are the different types of steel sections used in construction ? Explain in brief. [06]
- (B) Compare Load Bearing, Framed Structure and Composite Structure. [06]
- (C) Write a note on Recycling of Materials. [04]
- Q.5)** (A) Explain the following : [06]
- (1) Change Point
 - (2) Back Sight Reading
 - (3) Intermediate Sight Reading
 - (4) Fore Sight Reading
 - (5) Height of Instrument
 - (6) GTS Bench Mark
- (B) Briefly explain the following instruments : [04]
- (1) Digital Theodolite
 - (2) Digital Planimeter
- (C) Following staff readings were observed on a continuously sloping ground, along the centre line of a road, with the help of a dumpy level and 4m levelling staff at 20m interval. The

first reading was taken on starting point of road having R.L. 300.000m. 0.420, 1.660, 2.880, 0.580, 1.385, 2.190, 2.995 and 3.800.

- (1) Enter the readings in a page of level book.
- (2) Find R.L's by Rise and Fall Method, apply usual checks.
- (3) Determine Longitudinal Gradient of the Road. [08]

OR

- Q.6)** (A) Show following features in contour maps. Show minimum four contour lines for each : [04]
- (1) Vertical Cliff (with contour interval 0.5m)
 - (2) Valley Line with contour interval 2m (min. R.L. = 340m)
- (B) State the principle on which E.D.M. works. Also give two practical applications. [04]
- (C) Explain the terms G.I.S. and G.P.S. Also state their applications in Civil Engineering. [04]
- (D) The levelling work was conducted between T.B.M. 'A' (R.L. 508.905M) and T.B.M. 'B' (R.L. 500.690M)
The readings taken were :
0.750, 1.780, 2.935, 3.410, 0.425, 3.685, 0.680 and 2.975
The instrument was shifted after 4th and 6th reading. Book the entries in tabular form, reduce the levels and exercise the arithmetic check. (Solve by Collimation Plane Method) [06]

SECTION - II

- Q.7)** (A) Explain with a neat sketch : Nitrogen Cycle. [2+4=06]
- (B) Enlist any 4 methods of carrying out EIA. Explain with a neat sketch : Overlays Method. [2+4=06]
- (C) Explain in detail : Compositing as a Technique for Management of Solid Waste. [06]

OR

- Q.8)** (A) Enlist any 4 natural resources. Explain in detail, the necessity of conserving natural resources. [2+4=06]
- (B) Explain in detail, adverse environmental impacts of the solid waste. [06]

(C) Explain with a neat sketch, any two of the following : [2x3=06]

- (1) Grassland Ecosystem
- (2) Desert Ecosystem
- (3) Ocean Ecosystem

Q.9) (A) Enlist any 8 principles of Planning. Explain in detail : Economy and Orientation as Principles of Planning. [4+2+2=08]

(B) On a plot of size 24 m × 35 m, the shorter side is facing the main road. If front margin is 3M and all other margins being 2m each, calculate the possible construction on each of the floors of a G + 2 storeyed building, if full ground coverage (after sparing the margins) is intended. Assume equal construction on 1st and 2nd floor. FSI allowed in the area is 1.5. [08]

OR

Q.10) (A) State and explain in detail, any 4 guidelines to be used for achieving green buildings. [4x2=08]

(B) A plot owner proposed G + 1 construction with 225 m² on each floor, on a plot of size 20m × 25m. If all margins are 2.5m and FSI allowed is 1.0, calculate additional construction possible on the plot. If maximum possible construction is to be made on the ground floor (after sparing the margins), calculate the possible additional construction on ground floor and first floor, if any. [08]

Q.11) (A) Explain in detail, 4 causes of Air Pollution and enlist 4 sources of Air Pollution. [4+2=06]

(B) Enlist any 4 remedial measures to abate Land Pollution. Explain any one in detail. [2+4=06]

(C) Enlist any 4 non-industrial sources of Noise. Comment on any one of them in brief. [2+2=04]

OR

Q.12) (A) "As far as possible, we should utilize non-conventional energy sources." Explain the above statement. [06]

(B) Write a detailed note on : Water Pollution. [06]

(C) Explain in detail various possible measures to control Noise Pollution. [04]