Seat No.

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MAR_APR 2026 SUMMER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Geotechnical Engineering - I

Sub. Code: 66238/80766/81003

Day and Date: Monday ,18-05-2026 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions:
1. **All questions are compulsory**
2. **Assume suitable data wherever necessary and mention it boldly**
3. **Draw neat labelled diagrams wherever necessary**
4. **Figures to the right indicate full marks**

Q1) Attempt any two questions: **[12]**

a. Define Soil Structure **[6]**

b. Explain IS Classification system **[6]**

c. Describe in detail Three Phase System **[6]**

Q2) Attempt all questions: **[11]**

a. Explain with neat sketch permeability of soil by constant head method **[6]**

b. Define the flow net and also sketch the application of flow net **[5]**

Q3) Attempt any two questions: **[12]**

a. Describe consolidation and factors affecting on it **[6]**

b. Explain in detail Standad Proctor Test **[6]**

c. A lab compaction test on soil having specific gravity of 2.7 gave a maximum dry density of 18 kN/m^3 and water content of 15%. Determine the degree of saturation and air content **[6]**

Q4) Attempt all questions: **[11]**

a. Explain in detail vertical stress distribution on a horizontal plane. **[6]**

b. Describe concept of Isobars and pressure bulbs **[5]**

Q5) Attempt any two questions: **[12]**

a. Explain Mohr Coulomb's theory and failure envelope in detail **[6]**

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b. Explain direct shear test with neat sketch. **[6]**

c. Determine direct shear strength of soil sample tested by vane of diameter 75 mm and height 75mm.If torque applied is 30 N.m. **[6]**

Q6) Attempt any two questions: **[12]**

a. Explain Bell Rankine's theory for the cohesive soil under dry condition **[6]**

b. Defibe earth pressure at rest **[6]**

c. A retaining wall 4 m high, has a smooth vertical back. The backfill has a horizontal face in level with the top. There is uniform surcharge of 36 kN/m^2 intensity over the backfill. The unit weight of backfill is 18 kN/m^3 and angle of shearing resistance is 30° & cohesion is zero. Determine magnitude & point of application of active earth pressure per meter length of wall **[6]**

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (101) Bachelor of Engineering (66238) Geotechnical Engineering - I Part 3 SEM 5
2] (101) Bachelor of Engineering (81003) Geotechnical Engineering - I Part 3 SEM 5
3] (1154) B.Tech. CBCS (80766) Geotechnical Engineering - I Part 3 SEM 5

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