Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **18CE3072** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PAVEMENT ANALYSIS AND DESIGN** | **Max. marks :** | **100** |

**ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Define equivalent single wheel load and state its influence in the design. | CO1 | 2 |
| b. | Sketch the various components of flexible pavement and brief on its function. | CO1 | 4 |
| c. | For the flexible pavement condition shown in fig. Calculate the following values using one layer theory equations   1. Δ at point m. 2. σ z and εr at point o. 3. σ1,2,3 and Ʈmax at point p   Untitled | CO1 | 10 |
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| 2. | a. | List down the factors affecting flexible pavements. | CO2 | 2 |
| b. | Distinguish the relation between Unsoaked and Soaked California Bearing Ratio test. | CO2 | 4 |
| c. | Explain the step by step procedure for the design of flexible for a given loading condition. | CO2 | 10 |
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| 3. | a. | Explain the need for joints in cement concrete pavements. | CO3 | 2 |
| b. | Sketch and explain a longitudinal Joint. | CO3 | 4 |
| c. | A cement concrete pavement is to be designed for a two lane two way National Highway in the Punjab State. The total two way traffic is 3000 commercial vehicles per day. The design parameters are:  Flexural strength of cement concrete = 4.5MPa  CBR of subgrade = 6%  Corresponding modulus of subgrade reaction = 45kPa/mm  Thickness of DLC subbase = 150mm  Effective modulus of subgrade reaction = 242.5 kPa/mm  Elastic modulus of concrete = 30000MPa  Poison’s ratio = 0.15  Coefficient of thermal expansion of concrete = 10x10-6 /0C  Tyre pressure = 0.8Mpa  Rate of traffic growth r = 6%  Temperature = 15.80C | CO4 | 10 |
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| 4. | a. | List out the effects of structural failure in flexible pavements. | CO3 | 2 |
| b. | Categorize the special consideration in the design of Continuously Reinforced Concrete Pavement. | CO4 | 4 |
| c. | Discuss Benkelman beam test in the design of overlay on flexible pavements. | CO4 | 10 |
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| 5. | a. | Define Soil Stabilization. | CO5 | 2 |
| b. | List out the different functions of stabilizers. | CO5 | 4 |
| c. | Classify the different types of admixtures used in soil stabilization. Elaborate any one in detail. | CO5 | 10 |
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| 6. | a. | Distinguish the relation between Resilient Modulus and Diametress resilient modulus. | CO5 | 2 |
| b. | Brief the Evaluation of Cohesion and angle of shear resistance of soil from triaxial compression testing. | CO6 | 4 |
| c. | An embankment is protected by pitching laid over a filter layer. The embankment soil gradation is as under:   |  |  | | --- | --- | | Sieve Size | Percentage Passing | | 1.18mm | 100 | | 425micron | 95 | | 300micron | 85 | | 150micron | 60 | | 75micron | 15 | | 53micron | 9 |   Design the Filter material. | CO6 | 10 |
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| 7. | a. | Brief on the serviceability index of rural roads. | CO5 | 8 |
| b. | List down the uses of geo fabrics in road construction. | CO5 | 8 |
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| **COMPULSORY QUESTION (1 x 20 = 20 Marks)** | | | | |
| 8. |  | Discuss the importance of drainage in pavement. Design and sketch the drainage system for a Two lane road pavement. | CO6 | 20 |