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Total No. of Pages : 02

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B.Tech.(CE) (2012 to 2017) (Sem.-7,8) PAVEMENT DESIGN Subject Code : BTCE-818 M.Code : 71877

Time: 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a. Define Warping Stresses.
- b. What do you mean by overlay and write various types of it?
- c. What is the basic design difference between airport pavement and highway pavement?
- d. What are the different types of joints in cement concrete pavements?
- e. What are the drawbacks of CBR method of flexible pavement design?
- f. What were the objectives of the AASHTO Road test?
- g. Define CRCP.
- h. What do you mean by fibre reinforced concrete for pavements?
- i. What is the formula used for design of a dowel bar?
- j. Define Perpetual Pavements.

SECTION-B

2. Explain :

- a. Radius of relative stiffness.
- b. Equivalent radius of resisting section.
- c. Critical Loading positions.

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- 3. Write down the design steps for slab thickness of cement pavement, recommended by IRC: 58-2011.
- 4. Explain briefly the fatigue behaviour of the concrete & how it is utilized in the PCA design method.
- 5. Write down the various factors affecting the pavement design. Explain it.
- 6. Explain the Marshall method of bituminous mix design.

SECTION-C

- 7. a. Give a sketch showing the various layers in pavements, generally adopted in India.
 - b. What are the functions of each of the above layers?
- 8. a. Explain the Boussinesq's theory and how it can be used for the design of highway pavements.
 - b. Write down its limitations.
- 9. Check the adequacy of dowel bar system for a concrete pavement using the following data.

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Slab thickness = 33 cm

Joint width = 2 cm

Radius of relative stiffness = 103.53 cm

Design wheel load = 8000 Kg

Percentage of load transfer =40

Grade of concrete to be used = M40

Diameter of dowel bar = 32 mm

Spacing of dowel = 32 cm

Modulus of dowel/concrete interaction = 41500 kg/cm<sup>2</sup>/cm

E for steel = 2 \times 10^6 Kg/cm<sup>2</sup>
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NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.