

**M.E. CONSTRUCTION ENGG 2<sup>nd</sup> YEAR 2<sup>ND</sup> SEMESTER EXAMINATION, 2025**

**Repair & Retrofitting Technique – II**

Time : Three hours

Full Marks : 100

50 marks for each Part.

( Use separate answer-script for each Part.)

**Part -I**

Answer any **Two Questions**

**Explain your answer with neat sketches if necessary.**

**No Codes are allowed**

1.
  - a) Differentiate between **Repair, Rehabilitation and Retrofitting** of structures in the context of **Seismic considerations**? **5**
  - b) Discuss the **three 'P'** concept of **Disaster Mitigation** and their **role** on the three major **disasters** in India e.g. **Earthquake, Cyclone and Flood**. **5**
  - c) Discuss on **Five Nos. Global Seismic Retrofit Strategies** of R.C.C buildings. **10**
  - d) Discuss on **Seismic Retrofit of Brick Masonry Wall** by **Re-pointing** technique. **5**
  
2.
  - a) Discuss **Seismic Evaluation in the context of Seismic Retrofit** of structures? **4**
  - b) Discuss on the different **configuration related checks** to be made for the **Seismic Evaluation** of Reinforced Concrete Building Structures. **6**
  - c) Discuss on **Strength-Related** checks for **Shear Stress** and **Axial Stress** under the **preliminary evaluation** for RCC frame? **10**
  - d) Write down the **conditions** when **Detail Seismic Evaluation** is recommended. **5**
  
3.
  - a) Discuss the **Objectives, Outcomes** and **Limitations** of '**Push-Over Analysis**', indicating the **significance** of **Performance point** for seismic retrofit. **12**
  - b) Discuss **Base Isolation Technique** for **Retrofit** of **Historical buildings**? **6**
  - c) Discuss on the "**Force-Displacement Trade-off**" for designing the **Isolation Ratio** adopting base isolation technique for retrofitting of existing buildings. **7**

[ Turn over

. M.E. Construction Engineering 2<sup>nd</sup> year 2<sup>nd</sup> Semester Examination-2025

**Repair and Retrofitting Technique-II**

Time: Three hours

Full Marks: 100

**Part – II**  
**(50 Marks)**

Answer any two questions. (Assume relevant data if required).

Q-1 (a) Explain why FWD is considered a better equipment with respect to Benkelman beam for condition monitoring of bituminous road pavement . ( 8 )

(b) Explain the effect of temperature in Concrete Overlay design. (5)

© Explain with arguments whether the moisture correction factors for deflection measurement can be less than 1.0 or not ? (4)

(d) Explain why joints are essential in concrete overlay whereas that is not required in Bituminous Overlay. (8)

Q-2 (a) Define IRI and RI . Discuss significance of roughness data in condition monitoring of road pavements. (4+5)

(b) Is there any importance of vehicle speed during roughness measurement in field condition. Justify your answer . (4)

© Determine the design load for overlay design( msa) for a four lane national highway passing through plain terrain near Kolkata with an initial traffic of 1625 CVPD (6)

(d) If the VDF becomes double due to overloading then determine the changes in service life of the road. (6)

Q-3(a) A TWT has been designed for a two lane undivided major district road in South 24 Pgs district in West Bengal with a thickness of 160 mm and with a square panel of 1500 mm on a subgrade with a modulus of subgrade reaction (k) = 10

kg/cm<sup>3</sup> . Is the design safe against load and temperature stress ? Moreover estimate the fatigue life of the overlay . (15)

(b) Why 'skid value' of road sections are important for road safety monitoring . (5)

© What is the significance of repair of a bituminous road with reference to its service life by widening and putting overlay . (5)