

MANMOHAN TECHNICAL UNIVERSITY OFFICE OF CONTROLLER OF EXAMINATION Exam Year: 2083, Jesta (Model Question)		Exam Roll No. Exam Roll No. in Words.
School: SOE	Level: BE	Invigilator's Sign.....
Program: Civil	Year/Part: IV/I	Superintendent's Sign.....
Subject: Design of Bridge (EG 711 CE)		Code No.

Group A [10 × 1 = 10] Attempt all Questions

Instructions:

- Choose one answer out of four options
- Use black ball pen for shading only one circle for correct option of a question in Answer Sheet which you have been provided • No marks will be awarded for cutting, erasing, over writing and multiple circles shading.

- A bridge designed to allow normal floods to pass through its vents, but allowed to be over-topped during floods is called.....**
 a) Seasonal bridge b) Under bridge c) Fair weather bridge d) Submersible bridge
- The impact factor used in the design of bridge decks is always inversely proportional to**
 a) the span of bridge b. the width of bridge deck c. types of bridge deck d. Live load intensity
- When a bridge is constructed on a highly meandering river, the most critical design concern is:**
 a) Reduced construction cost b. Scour at piers and abutments
 c. Increased flow uniformity d. Decrease in live load
- In case of designing tee beam and slab bridge decks, the dispersion of the wheel loads should be considered in**
 a) the long span direction b. Short span direction
 c. Both long and short span directions d. No dispersion is considered
- The main function of flange plate in a steel plate girder is to resist**
 a) Flexure b. Shear c. Torsion d. Axial force
- The ultimate shear resistance of a prestressed concrete slab deck without design shear reinforcement depends upon**
 a) Prestressing force b. Depth of deck slab c. Tensile strength of concrete d. All of the above
- Due to the effect of buoyancy during floods, the dead weight of pier**
 a) Becomes zero during submergence b. Remains unchanged under all conditions
 c. Increases due to water pressure d. Decreases because of upward buoyant force
- A fixed bearing at one end and an expansion bearing at the other is provided in case of**
 a) Simply supported beams b. Continuous beams c. Overhanging beams d. None of the above
- Which bridge construction method is most suitable for deep valleys and rivers with difficult access?**
 a) Cast-in-situ method b. Incremental launching method c. Balanced cantilever method d. Timber staging method
- Which of the following is included in routine bridge maintenance?**
 a) Complete replacement of deck b. Cleaning drainage holes c. Reconstruction of piers d. Replacement of foundation

Multiple Choice Questions' Answer Sheet

Marks Secured: _____

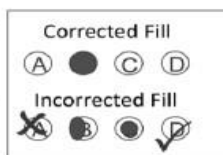
In Words: _____

Examiner's Sign: _____ Date: _____

Scrutinizer's Marks: _____

In Words: _____

Scrutinizer's Sign: _____ Date: _____



1. (A) (B) (C) (D)	6. (A) (B) (C) (D)
2. (A) (B) (C) (D)	7. (A) (B) (C) (D)
3. (A) (B) (C) (D)	8. (A) (B) (C) (D)
4. (A) (B) (C) (D)	9. (A) (B) (C) (D)
5. (A) (B) (C) (D)	10. (A) (B) (C) (D)

MANOMOHAN TECHNICAL UNIVERSITY
OFFICE OF THE CONTROLLER OF EXAMINATIONS
Exam Year: 2082, Jestha (Model Question)

School: SOE	Level: BE	Time: 3 hrs.
Program: Civil	Year/Part: IV/I	Full Marks: 50
Subject: Design of Bridge (EG 711 CE)		Pass Marks: 20

- Candidates are required to give their answers in their own words as far as practicable.
- Assume suitable data if necessary.
- IRC code and graphs are allowed.

Group A (Multiple Choice Questions) in separate paper

Group B Attempt any eight questions [8 × 2 = 16]

- | | |
|-----|---|
| 11. | Explain the different types of bridges based on deck position, namely deck type, through type, and semi-through type bridges, with neat sketches. |
| 12. | Explain the terms a) effective span b) Impact factor c) Dispersion of concentrated load with reference to the design of slab bridges. |
| 13. | What are the different types of forces acting in the piers? Explain about force due to Hydrodynamic Pressure. |
| 14. | Explain briefly the method of determining the live load bending moment in the girder of tee beam using Courbon's method. |
| 15. | Describe the advantages of post-tensioned girder bridges over conventional reinforced concrete bridges. |
| 16. | Why is prestressed method of construction is used commonly in Nepal? Write its construction steps. |
| 17. | What are the different types of joints? explain about their suitability. |
| 18. | Describe different types of bridge foundations and their applicability in Himalayan River environments. |
| 19. | Why should bridge be one of the most important "structures" in Structural Health Monitoring? Explain corrective maintenance. |

Group C

Attempt any three questions [8*3=24]

- | | |
|-----|---|
| 20. | Using the equivalent width method, determine the maximum bending moment and shear force in the shorter span direction of a restrained slab subjected to dead load and IRC Class AA tracked vehicle loading. The effective shorter span and longer span of the slab are 2.5 m and 4.5 m respectively. Assume the slab thickness as 230 mm and wearing coat thickness as 75 mm. [8] |
| 21. | Find maximum reaction on girder 3 of a bridge due to class AA tracked load by courbon's. 'EI' is same for all girders as shown in figure 1. [8] |

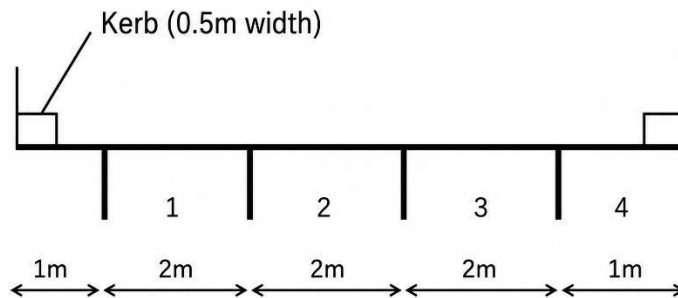


Figure 1

22. A post-tensioned concrete bridge consists of four girders as shown in figure 2 supporting the deck has following data.

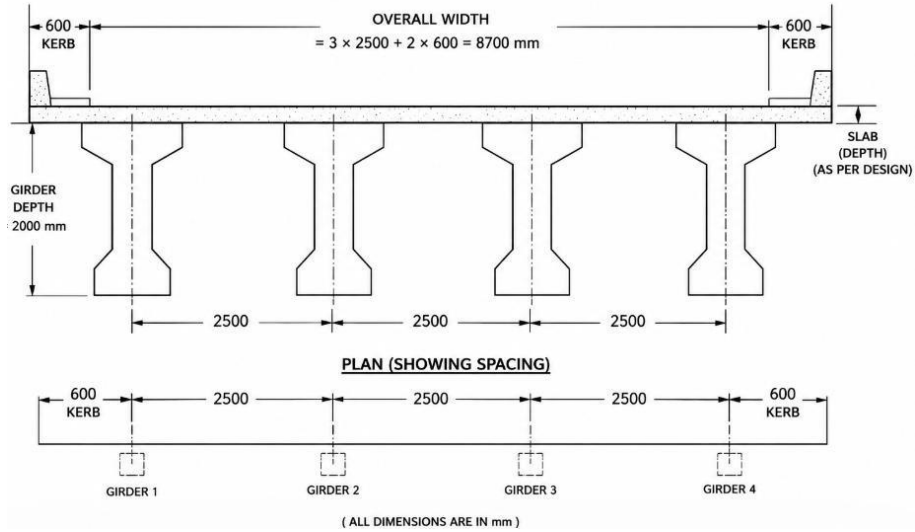


Figure 2

S.N	PARAMETERS	VALUE
1	Span of each Girder	38.75m
2	Cross- Section area of each Girder	0.90m ²
6	Live load	IRC Class AA(wheeled)
7	Effective cable eccentricity	0.675m
8	Prestressing cable type	19K13
9	Capacity of one 19K13 cable	3490 kN

Determine the following per girder:

1. Self weight of the girder (kN/m)
2. Total design bending moment (kN·m) including dead load and IRC Class AA wheeled live load (with impact)
3. Number of 19K13 prestressing cables required per girder [8]

23. Verify the adequacy of the dimensions of the pier shown in Figure-3. The following details are available.

Top width of pier = 1.6 m	Superstructure consists of three longitudinal girders of 1.4 m depth with deck slab 200 mm thick
Height of pier up to springing level = 10 m	Rib width of girders = 300 mm
Centre-to-centre distance of bearings on either side = 1 m	Material of pier = M15 concrete
Side batter = 1 in 12	Maximum mean velocity of water current = 3 m/s
High flood level = 1 m below the bearing level	Pier length = 9.5 m
Span of bridge = 16 m	Dead load from superstructure = 1480 kN
Loading on span = IRC Class AA	Unit weight of concrete in pier = 24 kN/m ³
Roadway = Two-lane road with 1 m wide footpath on either side	

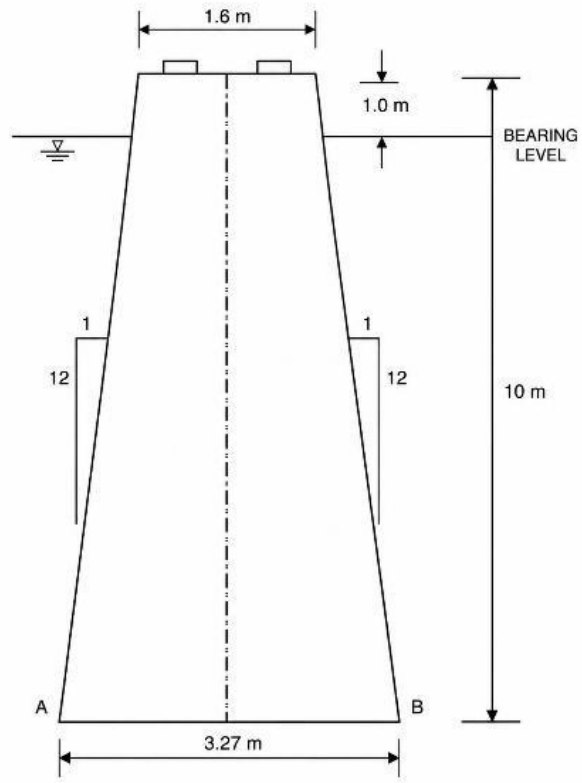


Figure 3

***** THE END*****