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Question Paper Code : 50343

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Fifth Semester

Civil Engineering

CE 8502 – STRUCTURAL ANALYSIS I

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the methods available for analysis of indeterminate trusses.
2. Define the term internal redundancy.
3. Write the slope deflection equation for a two span continuous beam.
4. When a frame is considered to undergo sway?
5. Define carryover factor.
6. Define distribution factor.
7. What do you mean by translation?
8. Define Joint rotation.
9. Define the term stiffness of a member.
10. List the properties of the stiffness matrix.

PART B — (5 × 13 = 65 marks)

11. (a) Determine the forces in the member of the structure as shown in figure Q.11(a) below by strain energy principle.

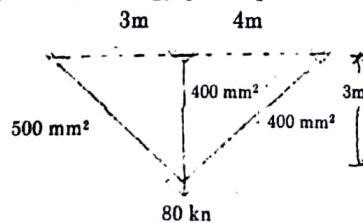


Fig. Q. 11(a)

Or



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- (b) A portal frame ABCD is hinged at A and D and rigid points B and C. The frame is loaded as shown in fig Q. 11(b) below. Analyze the frame using strain energy method.

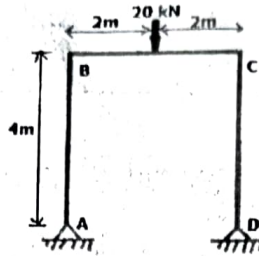


Fig. Q. 11(b)

12. (a) Analyze the beam loaded as shown in fig below by slope deflection method and draw the BMD. EI is constant throughout the length of the beam.

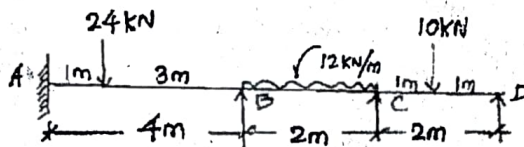


Fig. Q. 12(a)

Or

- (b) Analyze the frame by using slope deflection method for the fig shown below and draw the BMD.

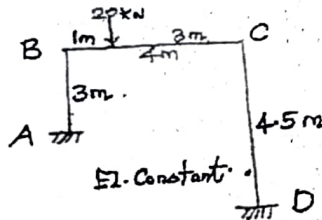


Fig. Q. 12(b)

13. (a) Analyze a portal frame shown in figure below using moment distribution method.

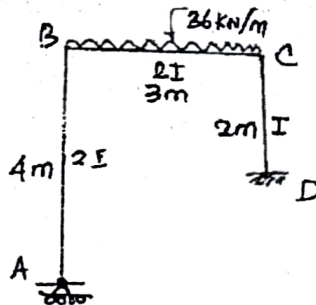
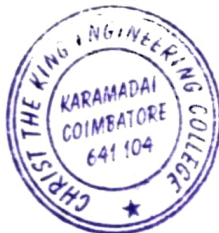


Fig. Q. 13(a)

Or

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- (b) Analyze a portal frame structure by the moment distribution system as shown in the figure and draw a bending moment diagram.

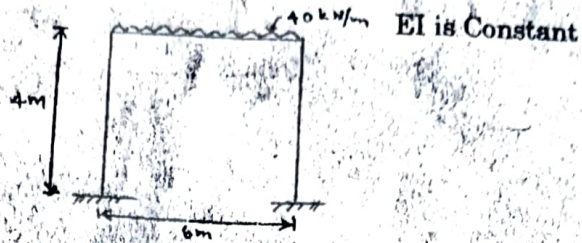


Fig. Q. 13(b)

14. (a) Analyze the continuous beam ABC as shown in the following figure by the flexibility matrix method and draw the bending moment diagram

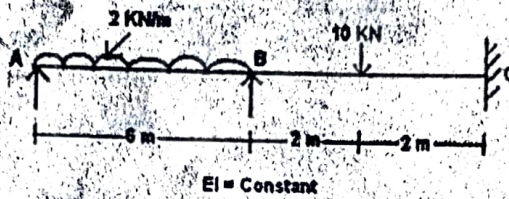


Fig. Q. 14(a)

Or

- (b) Analyze the continuous beam shown in the following figure by the flexibility matrix method.

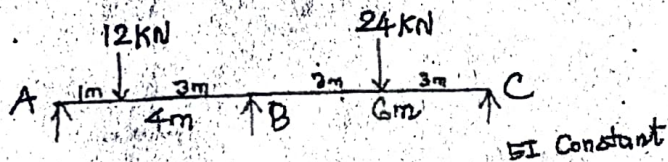


Fig. Q. 14(b)

15. (a) Analyze the beam using stiffness method as shown in the following figure

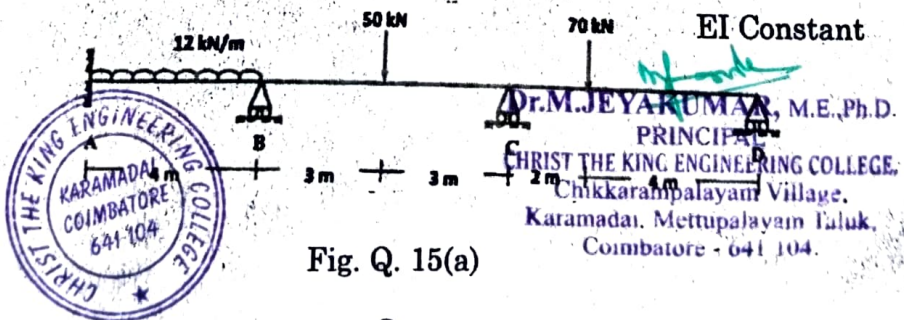


Fig. Q. 15(a)

Or

- (b) Analyze the beam as shown in the following figure by using stiffness method and draw the BMD.

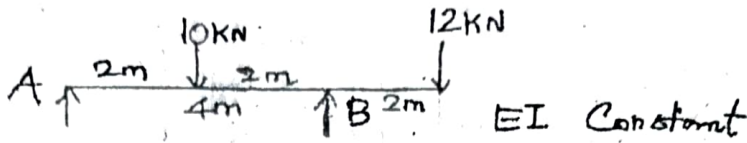


Fig. Q. 15(b)

PART C — (1 × 15 = 15 marks)

16. (a) Analyze the continuous beam ABC as shown in fig below using the flexibility matrix method and also draw the bending moment diagram.

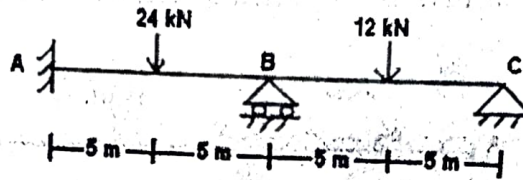


Fig. Q. 16(a)

Or

- (b) Analyze the portal frame ABCD shown in the figure using flexibility matrix method and also draw the bending moment diagram.

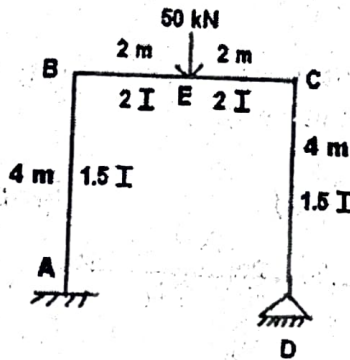


Fig. Q. 16(b)



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Question Paper Code : 50348

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Sixth Semester

Civil Engineering
CE 8604 – HIGHWAY ENGINEERING

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the significance of soil suitability analysis?
2. State the objectives of the Indian Road Congress.
3. Differentiate between lag or reaction distance and braking distance.
4. State requirements of an ideal transition curve.
5. What is rigidity factor in the design of Highway Pavements?
6. Mention the types of joints in rigid pavements.
7. State the purpose of applying tack coat in bituminous road construction.
8. How will you calculate the CBR value of highway materials?
9. Define the term "Highway Project Formulation."
10. What is meant by pavement serviceability index?

PART B — (5 × 13 = 65 marks)

11. (a) Describe the various classification of highways and their locations and functions.
Or
(b) Explain in detail the engineering surveys conducted for highway alignment.



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12. (a) Calculate the stopping sight distance required to avoid a head-on collision of two cars approaching opposite directions at 65kmph and 75kmph. Assume that the reaction time of drivers is 3 secs and the co-efficient between the road surface and tyres be 0.41.

Or

- (b) A National highway passing through a rolling terrain has a horizontal curve of a radius of 250m. If the design speed is 90 kmph, calculate super elevation, extra widening stopping sight distance and intermediate sight distance. Assume any other necessary data suitably.

13. (a) Explain in detail the various factors influencing the design of rigid pavements and the design procedure as per the IRC method.

Or

- (b) Describe in detail the IRC method of flexible pavement design. Discuss the limitation of this method.

14. (a) Explain the modern construction materials used for the construction of pavements and their characteristics and usage in detail.

Or

- (b) Explain in detail the surface and sub-surface drainage systems of roads with neat sketches.

15. (a) Describe in detail the symptoms, causes, and remedial measures for the different types of failure in flexible pavements.

Or

- (b) Illustrate in detail the methods employed for the evaluation of pavements.

PART C — (1 × 15 = 15 marks)

16. (a) Design the pavement for the construction of a new bypass with the following data:

Two lane carriageway, Initial traffic in the year of completion of

Construction = 400 CVPD (sum of both directions),

Traffic growth rate = 8%.

Design life = 20 years,

Vehicle damage factor based on axle load survey = 3.0

Standards axle per commercial vehicle, and

Design CBR of subgrade soil = 4%.



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50210

Reg. No. : **E N G G T R E E . C O M**

Question Paper Code : 21188

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

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Fourth Semester

Civil Engineering

GE 3451 — ENVIRONMENTAL SCIENCES AND SUSTAINABILITY

(Common to All branches)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is ecological succession?
2. List out the effect of habitat loss on biodiversity.
3. Mention the sources responsible for water pollution.
4. What is composting?
5. Distinguish between renewable and non-renewable energy sources.
6. What is a solar cell?
7. Define sustainable development.
8. Enumerate the concept of carbon credit.
9. What are the stages of a life cycle assessment LCA?
10. What are the benefits of environmental impact assessment?

PART B — (5 × 13 = 65 marks)

11. (a) Explain the structure and function of an ecosystem. Discuss the models of energy flow in an ecosystem.

Or

- (b) What are hotspots of biodiversity? Which are the hotspots found in India? Discuss their salient features.



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12. (a) What are the impacts of noise on human beings? Explain the various control measures for noise pollution.

Or

- (b) What are the major sources of soil pollution? How does soil pollution affect soil productivity? What measures can be taken to control soil pollution?
13. (a) How can electricity be produced from tides and waves? What is the potential of these energy resources?

Or

- (b) Compare the various types of energy with respect to its sustainability for Indian conditions.
14. (a) What do you mean by sustainable development and how will you attain the sustainability?

Or

- (b) What is the concept of carbon credit and how it originated? How is carbon credit calculated? How does buying carbon credits reduce pollution?
15. (a) Enumerate and explain the various methods of carbon capture and sequestration.

Or

- (b) What is the importance of sustainable urbanization? Explain the components of sustainable urban development.

PART C — (1 × 15 = 15 marks)

16. (a) How can you, as a individual to prevent environmental pollution? Why such an effort at individual level is important?

Or

- (b) Identify and explain the present day major threats to the biodiversity of India. Explain the major in-situ strategies of conservation of biodiversity.



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