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R18

Course Code: A30013



CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: BUSINESS MANAGEMENT & FINANCIAL ANALYSIS

(Civil Engineering)

Date: 05.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. What do you understand by leadership? 2 M
2. Explain any two characteristics of Management. 2 M
3. Explain the concept of marketing mix. 2 M
4. Write any two functions of HR management. 2 M
5. Briefly discuss about macroeconomics. 2 M
6. Write different stages in business cycle. 2 M
7. Define the theory of pricing. 2 M
8. Explain any two types of cost. 2 M
9. Explain the types of business enterprise. 2 M
10. Explain any two leverage ratios. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Examine Henry Fayol's 14 principles of management. 10M
- OR**
11. B). Explain the importance of management. Are management and administration similar? Discuss. 10M
12. A). Examine briefly the factors determining the location of an industrial plant. 10M
- OR**
12. B). Analyze the objectives and functions of financial management. 10M
13. A). Examine the scope of Managerial economics. 10M
- OR**
13. B). Examine the internal and external factors affecting on business environment. 10M

(P.T.O.)

14. A). Explain the important features of perfect competition. 10M

OR

14. B). A company reported the following results for two periods. 10M

<i>Period</i>	<i>Sales</i>	<i>Profit</i>
I	Rs.20,00,000	Rs.2,00,000
II	Rs.25,00,000	Rs.3,00,000

Ascertain the following

- i. P/V Ratio
- ii. Fixed Cost
- iii. B.E.P sales
- iv. Margin of safety of both periods.
- v. Sales required to earn a profit of Rs.6,00,000

15. A). Explain the different sources of raising finance in business. 10M

OR

15. B). What is meant by ratio analysis? Examine significance of ratio analysis in the business. 10M



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: **DESIGN & DRAWING OF RCC STRUCTURES**

(Civil Engineering)

Date: 07.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. What are the three methods of design of reinforced concrete structural Elements? Which of the three methods is the best? 2 M
2. Write down the advantages of limit state method over other methods. 2 M
3. Define flexural bond. 2 M
4. List out the important factors that influence bond strength. 2 M
5. Why is secondary/distribution reinforcement provided in one way RC slab? 2 M
6. Outline the codal provisions for minimum reinforcement to be provided main and secondary reinforcement in slab and their maximum spacing. 2 M
7. Write the basic assumption for the combined axial load and uniaxial bending on columns. 2 M
8. State the function of the traverse reinforcements in a reinforced concrete column. 2 M
9. Under what circumstances a trapezoidal footing become necessary? 2 M
10. List out the different types of footing. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Design a singly reinforced concrete beam as the following data 10M
 Clear span 4m
 Width of support 300mm
 Service load 5kN/m. Use M20 grade of concrete Fe 415 grade of steel.

OR

11. B). A rectangular beam is to be simply supported on supports of 230mm thick; the clear span of the beam is 6m. the beam is to have a width of 300mm. the characteristic super imposed load of 12KN/m. Using M₂₀ concrete and Fe415 steel, design the beam adopt limit state design method. 10M
12. A). A simply supported RC beam of size 300x500mm effective is reinforced with 4 bars of 16mm diameter HYSD steel of grade Fe415. Determine the anchorage length of the bars at the simply supported end if it is subjected to a factored force of 350 KN at the Centre of 300mm wide masonry supports. The concrete mix of grade M₂₀ is to be used. Draw the reinforcement details 10M

OR

12. B). Find the reinforcement required for a rectangular beam section for the following data. 10M
 Size of the beam 300mmX500mm,
 Factored moment=80 kN-m,
 Factored torsion=40 kN-m,
 Factored shear force =70 KN.
 Use M₂₀ concrete and Fe 415 steel.

(P.T.O..)

13. A). Design a R.C. slab for a room measuring 5m x 6m size. The slab is simply supported on all the four edges, with corners held down and carries a superimposed load of 30 N/m². Inclusive of floor finishes etc. use M₂₀ mix, Fe415 steel and IS code method. Draw the reinforcement details. 10M

OR

13. B). Design a one way reinforced concrete slab simply supported at the edges for a public building with a clear span of 4m supported on 200 mm solid concrete masonry walls. Live load on slab is 5 kN/m². Adopt M₂₀ grade concrete and Fe 415 HYSD bars. 10M

14. A). A circular column, 4.6m high is effectively held in position at both ends and restrained against rotation at one end only to carry an axial load of 1200kN, if its diameter is restricted to 450mm. Use M₂₀ and Fe415 grades 10M

OR

14. B). Design of short column subjected to biaxial bending. Determine the reinforcement for a short column for the following data. Column size: 400mmx600mm, P_u=2000kN, M_{ux}= 160kN-m, M_{uy}=120kN-m. Use M₂₀ grade concrete and Fe415 grade steel. 10M

15. A). Design an isolated square footing for a column 500mm x 500mm transmitting a load of 600 kN and a moment of 30 kN-m. The SBC of soil is 1230kN/m². Use M₂₀ grade concrete and Fe415 bars. Draw the reinforcement details. 10M

OR

15. B). A reinforced concrete column of 500mm x 650mm carries the axial dead load of 670 kN, axial imposed load of 330kN and dead load moment of 66kN-m, imposed load of 34 kN-m. If the SBC of soil is 150 kN/m² and use concrete grade of M₂₅ and steel grade of Fe415. The foundation has to be designed to resist the ultimate moment and shear resulting from these loads. 10M

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Course Code: A30116



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: GEOTECHNICAL ENGINEERING

(Civil Engineering)

Date: 09.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

- | | |
|--|-----|
| 1. Name the various soils based on mode of transportation. | 2 M |
| 2. What are the various results obtained from sieve analysis test? | 2 M |
| 3. Write down various factors on which permeability depends? | 2 M |
| 4. What is quicksand condition? | 2 M |
| 5. What is an Isobar? | 2 M |
| 6. Define relative compaction. | 2 M |
| 7. What is over consolidation ratio? | 2 M |
| 8. What is the formula used to calculate time factor, when degree of consolidation is 40% and 90%? | 2 M |
| 9. What is the importance of Mohr's stress circle? | 2 M |
| 10. What is the simplicity in Unconfined Shear test compare with tri-axial test? | 2 M |

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- | | |
|---|----|
| 11.A). i) Define various terms: void ratio, porosity, degree of saturation, specific gravity. | 4M |
| ii) Explain in detail IS classifications of soil. | 6M |

OR

- | | |
|--|-----|
| 11. B). The liquid limit and plastic limit of a soil are 50% and 25% respectively. When the soil was dried from its state at liquid limit, the decrease in volume was 40% of volume at liquid limit. When it was dried from its state at plastic limit, the volume decrease was 20% of the volume at plastic limit. Determine the shrinkage limit and shrinkage ratio. | 10M |
|--|-----|

- | | |
|--|----|
| 12. A). i) Explain the advantages of permeability by in-situ methods. | 5M |
| ii) Explain with proper sketch and formula, how to determine permeability of unconfined aquifer. | 5M |

OR

- | | |
|---|-----|
| 12. B). A sand deposit is 10 m thick and overlies a bed of soft clay. The ground water table is 3m below the ground surface. If the sand above the ground water table has a degree of saturation of 45%. Plot the diagram showing the variation of the total stress, pore water stress and effective stress. The void ratio of sand is 0.7. Take $G = 2.65$ and unit weight of water as 9.81 kN/m^3 . | 10M |
|---|-----|

(P.T.O.)

13. A). i) Differentiate between standard compaction test and modified compaction tests. 5M
 ii) Explain various types of compaction equipment's. 5M

OR

13. B). A concentrated load of 100 kN is acting on the ground surface. Determine the vertical stress on vertical plane located at a distance of 2 m & at a depth of 1.0m, 2.0m, and 3.0m. Also comment on the resultant stress at these points. 10M

14. A). Explain square root time fitting method to determine the coefficient of consolidation. 10M

OR

14. B). A 3 m thick clay layer beneath a building is overlain by a permeable stratum and is underlain by an impervious rock. The coefficient of consolidation of the clay was found to be $0.025 \text{ cm}^2/\text{minute}$. The final expected settlement of the layer is 8 cm. i) How much time will it take for 80% of the total settlement to takes place? ii) Determine the time required for a settlement of 2.5 cm to occur. 10M

15. A). i) What are the advantages of tri-axial compression test? 4M
 ii) Explain the various tests which can be performed using tri-axial equipment. 6M

OR

15. B). The following results were obtained from a series of consolidated undrained tests on a soil, in which the pore water was not determined. Determine the cohesion intercept and the angle of internal friction. 10M

Sample number	Confining pressure (k.Pa)	Deviatoric stress at failure (k.Pa)
1	100	600
2	200	750
3	300	870

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Course Code: A30141



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: **INDUSTRIAL WASTE WATER TREATMENT**

(Civil Engineering)

Date: 12.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. What is Industrial waste water? How is it different from domestic sewage? 2 M
2. Explain the physical properties of Industrial waste. 2 M
3. What are the primary treatment methods? 2 M
4. What are the advantages of Equalization in Industrial wastes? 2 M
5. How effective is nitrification when compared with de-nitrification process. 2 M
6. Enlist the safe disposal methods of waste water. 2 M
7. What is the composition of waste water in Steel Industry? 2 M
8. Mention the composition of waste water in Petroleum refinery. 2 M
9. Mention the limitations and drawbacks of CETP. 2 M
10. Write short notes on atomic energy plants. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). What are the important chemical parameters of Industrial waste water? Explain the method of testing any three parameters 10M
- OR**
11. B). Can all Industrial wastes be treated in municipal sewage treatment plants? What are limitations to treat Industrial waste along with domestic waste water? 10M
12. A). Mention the major methods for neutralizing alkali and acid wastes? Explain any 2 methods. 10M
- OR**
12. B). What is equalization and the purpose of equalization? What are the methods of equalization and explain any two methods? 10M
13. A). i) Differentiate nitrification and denitrification. 5M
ii) Describe the problems arising when Industrial wastes are disposed into river water. 5M
- OR**
13. B). Explain the process for Phosphorous removal from Industrial waste. 10M

(P.T.O..)

14. A). What are the major chemical constituents in waste water obtained from sugar Industry? 10M
Discuss the treatment technologies to remove the contaminants

OR

14. B). Explain the sources of petroleum Industry wastes and the recommended process to treat them. 10M

15. A). Discuss the most common operational problems along with their trouble shooting methods in CETPs. 10M

OR

15. B). Explain the characteristics of waste from tanneries and recommend process for treating them. 10M

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Course Code: A30142



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: ENVIRONMENTAL IMPACT ASSESSMENT

(Civil Engineering)

Date: 12.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Define EIA. 2 M
2. Illustrate Environmental base map. 2 M
3. Recall the term stepped matrix. 2 M
4. Explain cost benefit analysis in EIA. 2 M
5. Why soil quality is needed in EIA? 2 M
6. State the objectives of mitigation plan. 2 M
7. What is the purpose of EIA report? 2 M
8. State the objectives of EIA audit. 2 M
9. Draw flowchart for wastewater treatment plant. 2 M
10. State the Environmental impact of water pollution. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Describe in detail the elements of EIA and the various factors affecting EIA and also explain preparation of base map briefly 10M
- OR**
11. B). Discuss in detail about the environmental parameters and any one methodologies adopted for EIA analysis. 10M
12. A). Describe the assessment of impact of development activities on wildlife. 10M
- OR**
12. B). Describe the basic steps to be followed in prediction and assessment of social impact. 10M
13. A). Explain the methods adopted for procurement of relevant soil quality in detail 10M
- OR**
13. B). Enumerate the various environmental impacts and mitigation of road development projects. 10M
14. A). List out the various types of environmental audit and explain any two in detail 10M
- OR**
14. B). Explain the environmental legislation objectives of environmental audit in detail. 10M
15. A). Discuss the mitigation methods for water pollution to industrial process. 10M
- OR**
15. B). Summarize the various various air pollution act and mitigation measures to be followed to control it. 10M

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Course Code: A30118



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: **STRUCTURAL ANALYSIS-II**

(Civil Engineering)

Date: 14.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

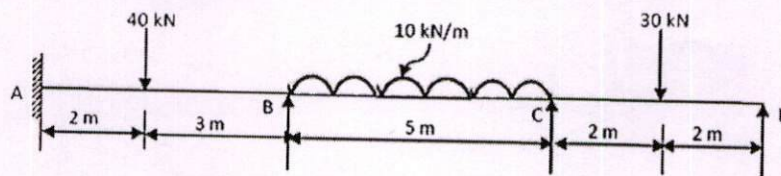
1. Under which category of indeterminate structural analysis does the moment distribution method fall – Force method or Displacement method? Explain why? 2 M
2. Explain the concept of Kani's method of structural analysis in brief. 2 M
3. Write the slope deflection equation. 2 M
4. Write the steps for analysis of two hinged arches. 2 M
5. Write the assumptions in portal method. 2 M
6. Under which conditions is the Cantilever method of approximate analysis for building frames best suited. 2 M
7. What do you mean by Degree of Indeterminacy? 2 M
8. Distinguish between Force Method and Displacement Method of Analysis of Indeterminate structures. 2 M
9. Draw the influence line for the reaction of the prop for the propped cantilever beam, propped at the free end. 2 M
10. Differentiate between BMD & ILD. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

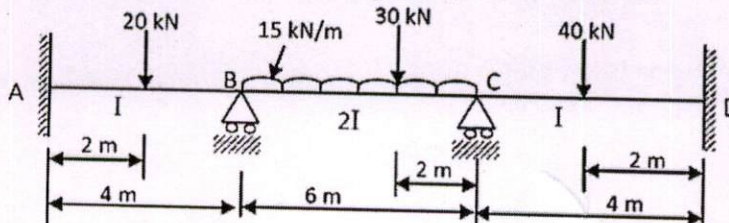
5x10=50M

- 11.A). Analyze the continuous beam as shown in figure below by moment distribution method. Draw the bending moment diagram. EI is constant. 10M



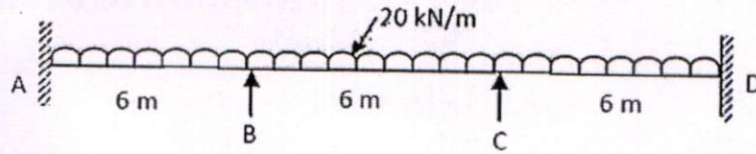
OR

- 11.B). Analyze the continuous beam shown in the figure by Kani's method. 10M



(P.T.O..)

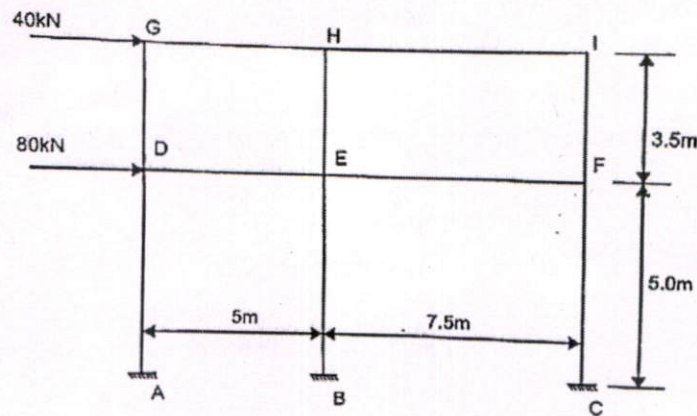
12. A). Analyze the continuous beam shown in figure below by slope deflection method and sketch SFD and BMD. EI is constant. 10M



OR

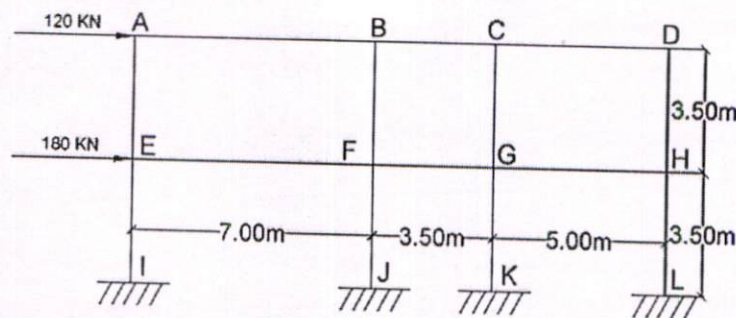
12. B). A two-hinged parabola arches of span 30m and rise 6m carries two-point loads, each 60kN, acting at 7.5 m and 15m from the left end, respectively. The moment of inertia varies as the secant of slope. Determine the horizontal thrust and maximum positive and negative moments in the arch rib. 10M

13. A). Using the portal method, analyze the building frame subjected to horizontal force (due to wind) as shown in Figure below. Sketch the bending moment diagram. Take k is constant for all members. 10M

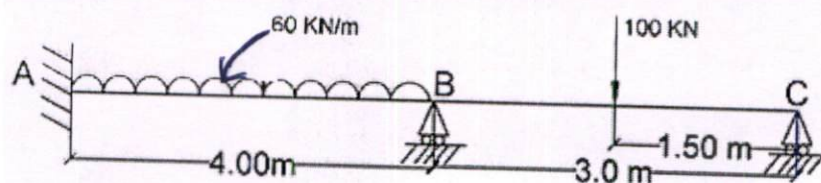


OR

13. B). Using the Cantilever method, analyses the building frame subjected to horizontal force (due to wind) as shown in Figure below. Sketch the bending moment diagram. Take k is constant for all members. 10M



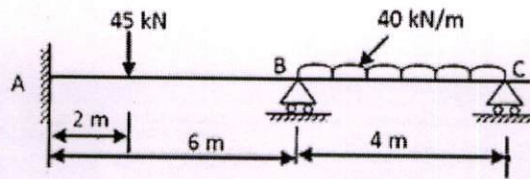
14. A). Analyze the continuous beam shown in figure below by stiffness matrix method. Draw the bending moment diagram. Take EI is constant throughout. 10M



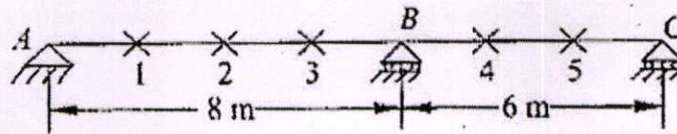
(P.T.O..)

OR

14. B). Analyze the continuous beam given in figure below by the flexibility method. Draw the bending moment diagram. Take $AB=2I$, $BC=CD=I$. 10M

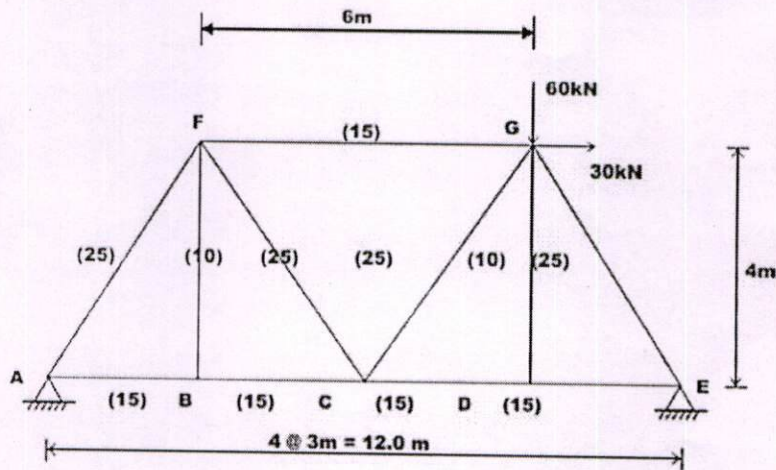


15. A). Draw the influence line diagram for moment B in the continuous beam shown in the below figure after calculating ordinates at 2 m intervals. Assume EI is constant throughout. 10M



OR

15. B). Calculate reactions and member forces of the truss shown in Figure by force method. The cross-sectional areas of the members in square centimeters are shown in parenthesis. Assume $E = 2.0 \times 10^5 \text{ N/mm}^2$. 10M



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Course Code: A30117



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: **TRANSPORTATION ENGINEERING-I**

(Civil Engineering)

Date: 16.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

- | | |
|--|-----|
| 1. Define IRC. | 2 M |
| 2. Illustrate any two different road network patterns. | 2 M |
| 3. Identify the purpose of Intermediate Sight distance. | 2 M |
| 4. List out how the pavement can be rotated for removal of camber. | 2 M |
| 5. Discuss the importance of OD study. | 2 M |
| 6. Explain the necessity of collision diagram. | 2 M |
| 7. Outline the difference between providing and not providing channelizing island. | 2 M |
| 8. Choose when rotary island should be provided. | 2 M |
| 9. Explain different types of joints used in Cement Concrete pavements | 2 M |
| 10. Define seal coat and prime coat in flexible pavements constructions. | 2 M |

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Discuss on the various types of surveys conducted for aligning a new highway. 10M

OR

11. B). Outline the salient features of first and second twenty-year road development plans of India. 10M

12. A). Analyze the stopping sight distance that has to be required for a vehicle to safely stop on pavement. 10M

OR

12. B). The speeds of overtaking and overtaken vehicle are 70kmph & 40kmph respectively on a two-way traffic road. If the acceleration of overtaking vehicle is 0.99 m/sec^2 . Calculate.
- | | |
|--|----|
| i) The safe overtaking sight distance. | 6M |
| ii) Min length of overtaking zone. | 2M |
| iii) Draw a near sketch of overtaking zone and show the position of signposts. | 2M |

13. A). What is meant by O&D study? Explain any six methods used in O&D studies. 10M

OR

13. B). List out the methods of signal designing. Elaborate on the trial cycle and websters method. 10M

(P.T.O..)

14. A). Illustrate and explain on any two types of intersections and interchanges 10M

OR

14. B). Design a Rotary intersection with a neat sketch. Mention any two advantages and disadvantages in detail. 10M

15. A). Discuss any two step-by-step Test procedures of a bitumen with neat sketch in detail. 10M

OR

15. B). Discuss the pavement failures of a flexible pavement and also highlight on the methods of maintenance of pavements. 10M

H.T No:

R18

Course Code: A36635



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech (Minors in AI&ML) V Semester Regular Examinations December-2022

Course Name: **FOUNDATIONS OF ARTIFICIAL INTELLIGENCE**

(Common for CIVIL, EEE, MECH, ECE, IT & CSC)

Date: 19.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Define Artificial Intelligence. 2 M
2. Label the syntax for predicate logic. 2 M
3. Name the three types of classification problems in machine learning. 2 M
4. Compare supervised learning and unsupervised learning. 2 M
5. How to choose step size adaptively in Gradient descent method? 2 M
6. Suggest a real time example for linear regression. 2 M
7. Show the cost function for logistic regression. 2 M
8. Can we use logistic regression for multiple classes? How? 2 M
9. List out the applications of cluster analysis. 2 M
10. Mention the task of clustering. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Compare the procedural knowledge with declarative knowledge. 10M
 - OR**
 11. B). List out and explain any five mostly used artificial intelligence techniques. 10M
 12. A). Analyze the role of matrix theory and statistics for machine learning. 10M
 - OR**
 12. B). Interpret the idea of machines learning from data with examples. 10M
 13. A). Find the linear regression equation for the following set of data 10M
- | | | | | |
|---|---|---|---|----|
| X | 2 | 4 | 6 | 8 |
| Y | 3 | 7 | 5 | 10 |
- OR**
 13. B). Demonstrate the functionality of Gradient descent method for linear regression. 10M
 14. A). Examine the problem of overfitting with a suitable example. 10M
 - OR**
 14. B). Define classification. Illustrate the usage of logistic regression for performing classification. 10M
 15. A). Show and interpret the how can we classify the Clustering algorithm. 10M
 - OR**
 15. B). Inspect the implementation of agglomerative hierarchical clustering. 10M
