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**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R14) Supplementary End Semester Examinations – May/June 2017****HYDROLOGY & WATER RESOURCES ENGINEERING**

(Civil Engineering)

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.

All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either Part A or Part B only

- |       |   |    |
|-------|---|----|
| i.    | What is Hydrological Cycle?                             | 1M |
| ii.   | What is evapotranspiration?                             | 1M |
| iii.  | Define $\phi$ , $w$ , indices                           | 1M |
| iv.   | What is stream gauging?                                 | 1M |
| v.    | Distinguish between Aquifer and Aquifers                | 1M |
| vi.   | What is cone of depression?                             | 1M |
| vii.  | What is unit hydrograph?                                | 1M |
| viii. | Distinguish between flow irrigation and lift irrigation | 1M |
| xi.   | What is balancing depth of canal?                       | 1M |
| x.    | Define water logging.                                   | 1M |

- |        |   |     |
|--------|---|-----|
| Q.2(A) | i. List at least ten engineering activities where Hydrological studies are essential. | 5 M |
|        | ii. Describe various types of precipitation.  | 5 M |

**OR**

- |        |  |     |
|--------|--|-----|
| Q.2(B) | i. Define hydrological cycle. Sketch the cycle and tabulate the various processes and storages involved in the system. | 5 M |
|        | ii. What are the various methods available to record rainfall depth of a place?  | 5 M |

- |        |   |     |
|--------|---|-----|
| Q.3(A) | i. How does evaporation takes place? What are the factors that affect the evaporation?    | 5 M |
|        | ii. Explain energy budget method of computing lake evaporation. What are its limitations? | 5 M |

**OR**

- |        |   |     |
|--------|---|-----|
| Q.3(B) | i. Briefly explain the factors that affect the runoff from a basin.                                 | 5 M |
|        | ii. Describe the types of current meters normally used to measure mean velocity of water in rivers. | 5 M |

- |        |   |     |
|--------|---|-----|
| Q.4(A) | i. Explain (a) porosity (b) specific yield (c) zone of aeration | 5 M |
|        | ii. Derive equilibrium flow equation for confined aquifer.      | 5 M |

**OR**

- |        |   |     |
|--------|---|-----|
| Q.4(B) | i. Draw a unit hydrograph and explain the salient features.                       | 5 M |
|        | ii. A watershed 3130 sq.km was subjected to a storm of 4h duration from which the |     |

following hydrograph resulted.

5 M

Time (h)	3	6	9	12	15	18	21	24	3
Discharge (m <sup>3</sup> /sec)	20	16	175	270	230	200	170	150	130

Time (h)	6	9	12	15	18	21
Discharge (m <sup>3</sup> /sec)	115	100	90	80	70	60

What is the rainfall excess for the storm? Obtain an UH for the watershed.

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Q.5(A) i. What do you mean by design flood? Why its computation is so important for water resources projects. 5 M

ii. Enumerate various methods for estimating design flood. 5 M

**OR**

Q.5(B) i. What to you understand by routing of a flood write the basic equation in hydrologic reservoir routing? 5 M

ii. Derive the Muskingum channel routing equation  $O_2 = COI_2 + C_1I_1 + C_2OI$  5 M

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Q.6(A) i. Define canal. Give the classification of canals. 5 M

ii. Write the equations as per concept of Lacey's for design procedure of a true regime channel carrying a fixed discharge and transportation a given silt grade in an unlimited incoherent 5 M

**OR**

Q.6(B) i. What are the losses which occur in canal? Discuss the factors effecting seepage losses. 5 M

ii. Design a irrigation channel carrying 20m<sup>3</sup>/sec. Take silt factor as 1.2 use Lacey's theory. 5 M

**\*\*\* END\*\*\***

Hall Ticket No:

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Question Paper Code: 14CE111

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R14) Supplementary End Semester Examinations – May 2017**

**CONCRETE TECHNOLOGY**

(Civil Engineering)

**Time: 3Hrs**

**Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.  
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either Part A or Part B only

- |     |   |     |
|-----|---|-----|
| Q.1 | i. List Various types of cement.                                  | 1 M |
|     | ii. What is the common classification of aggregates               | 1 M |
|     | iii. What is meant by workability                                 | 1 M |
|     | iv. Define tension cracking                                       | 1 M |
|     | v. Define bond strength in concrete                               | 1 M |
|     | vi. Define shrinkage  | 1 M |
|     | vii. What are the factors affecting strength of concrete          | 1 M |
|     | viii. What are the requirements of concrete mix design as per BIS | 1 M |
|     | ix. What do you mean by fibre reinforced concrete                 | 1 M |
|     | x. What is meant by No-fines concrete                             | 1 M |
- 
- |           |  |      |
|-----------|--|------|
| Q.2(A)    | Explain Alkali aggregate reaction highlighting the mechanism of deterioration, factors affecting it and methods of control | 10 M |
| <b>OR</b> |  |      |
| Q.2(B)    | Explain in detail any two laboratory tests to be conducted on cement as per I.S.Specifications                             | 10 M |
- 
- |           |  |     |
|-----------|--|-----|
| Q.3(A)    | i. What are the factors affecting the workability of concrete            | 5 M |
|           | ii. Write detailed notes on bleeding of concrete                         | 5 M |
| <b>OR</b> |  |     |
| Q.3(B)    | i. What is Abram's law? How does it affect concrete?                     | 5 M |
|           | ii. What are the various factors affecting strength of hardened concrete | 5 M |
-

- Q.4(A) i. Why compressive strength usually considered being most important in concrete design 5 M
- ii. What is the importance of Creep and list out the factors affecting on creep 5 M

OR

- Q.4(B) i. Write short notes on Chemical analysis of hardened concrete 5 M
- ii. Write short notes on shrinkage and factors affecting it 5 M

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Q.5(A) Design the concrete mix for the following data : 10 M

- i. Characteristic compressive strength : 20 Mpa
- ii. Maximum size of aggregate : 20 mm ( angular )
- iii. Degree of workability : 0.9 CF
- iv. Degree of quality control : good
- v. Type of exposure : Severe
- vi. Water absorption by CA : 0.5 %
- vii. Moisture content in FA : 1.5 %
- viii. Assume any suitable missing data

OR

- Q.5(B) Design the concrete mix for grade M20 with suitable conditions. Find the quantities of constituents of the mix for a bag of cement 10 M

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Q.6(A) Distinguish between light weight concrete and high density concrete 10 M

OR

- Q.6(B) Explain the following 10 M
- i) Light weight aggregate concrete
  - ii) SIFCON

\*\*\* END\*\*\*

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R14) Supplementary End Semester Examinations –May / June 2017****ANALYSIS OF STRUCTURES - II**

(Civil Engineering)

Time: 3Hrs

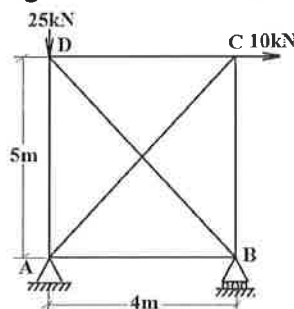
Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.

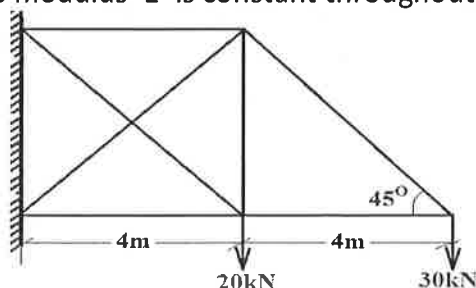
**All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either I or II only**

- Q.1
- |       |   |    |
|-------|---|----|
| i.    | Differentiate between determinate and indeterminate structures.   | 1M |
| ii.   | What is the horizontal thrust for a two hinged parabolic arch subjected to UDL of intensity 'w' per unit length over the left half of the span.                     | 1M |
| iii.  | Write the equation for the degree of static indeterminacy of rigid jointed plane frames.  | 1M |
| iv.   | State Eddy's theorem as applicable to arches.   | 1M |
| v.    | Write any two assumptions made in Cantilever Method.  | 1M |
| vi.   | Write about the classification of arches based on the material of construction.   | 1M |
| vii.  | What is the horizontal reaction at the supports, when a symmetrical cable of span 'L' and dip 'h' is subjected to a uniformly distributed load of 'w' per unit run. | 1M |
| viii. | If an eccentric Point Load of 'W' is acting at a distance of 'a' from the left support of a fixed beam of span 'L', then what are the fixed end moments.            | 1M |
| ix.   | State Castigliano's first theorem.  | 1M |
| x.    | Define degree of freedom with reference to beams.   | 1M |

- Q.2(A) Analyse the redundant frame shown in figure. The cross-sectional areas of horizontal members, vertical members and diagonal members are  $150 \text{ mm}^2$ ,  $200 \text{ mm}^2$  and  $350 \text{ mm}^2$  respectively. Young's modulus 'E' is constant throughout. 10M

**OR**

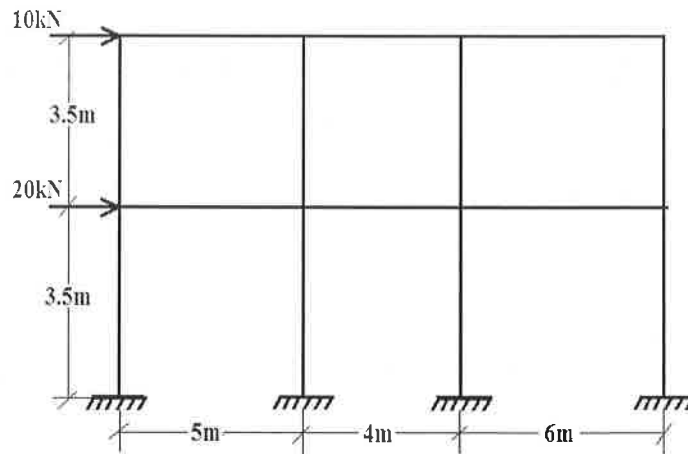
Analyse the frame shown in figure. The cross-sectional areas of all the members are equal and Young's modulus 'E' is constant throughout. 10M



Q.2(B)

Q.3(A) Analyse the frame shown in figure by Cantilever method.

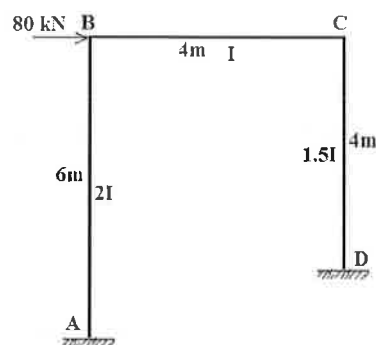
10M



OR

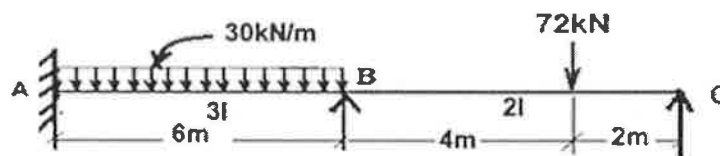
Q.3(B) Analyse the frame shown in the figure by Kani's Method.

10M



Q.4(A) Analyse the continuous beam shown in figure by flexibility method.

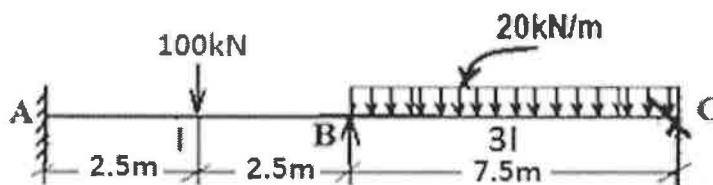
10M



OR

Q.4(B) Analyse the continuous beam shown in figure by stiffness method.

10M



Q.5(A) A two hinged parabolic arch of span 'L' and rise 'h' is subjected to a uniformly distributed load of 'w' over the entire span. Find the horizontal thrust at the supports, and show that the bending moment and radial shear at any section are zero.

10M

OR

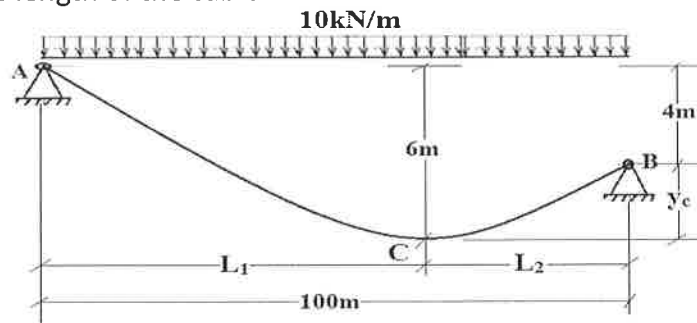
Q.5(B) A two hinged parabolic arch of span 12m and central rise 2.4m has secant variation for the moment of inertia of the rib and is loaded with two concentrated loads of 10kN each at a distance of 3m and 6m from right support. Find the horizontal thrust. Also find the BM, normal thrust and radial shear at a distance of 3m from left support.

10M

Q.6(A) A three hinged circular arch has a span of 50m and a central rise of 8m. A 100 kN load is acting at a point 15m measured horizontally from right support. Find (a) the horizontal thrust at the supports, and (b) the moment, normal thrust and radial shear at a section 15m from the left support. 10M

OR

Q.6(B) A Cable of uniform cross-sectional area is stretched between two supports 100m apart with one end 4m above the other as shown in figure. The cable is loaded with a uniformly distributed load of 10kN/m and the sag of the cable measured from the higher end is 6m. Find the horizontal tension and maximum tension in the cable. Also determine the length of the cable. 10M



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# MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R14) Supplementary End Semester Examinations – May / June 2017

## HIGHWAY ENGINEERING

(Civil Engineering)

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.

All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

- Q.1
- (a) What are the objectives of highway planning? 1M
  - (b) What are requirements for an idea alignment? 1M
  - (c) What is transition curve? 1M
  - (d) Define ruling gradient. 1M
  - (e) What is collision diagram? 1M
  - (f) What is the use of enoscope? 1M
  - (g) What is grade separated intersection? 1M
  - (h) Draw a neat sketch of intersection and show the conflict points. 1M
  - (i) Define toughness. 1M
  - (j) Differentiate between abrasion and attrition. 1M

- Q.2(A) Discuss the second twenty year road plan of 1961-81 and its salient features. 10M

OR

- Q.2(B) Explain obligatory points. With sketches, discuss how these control the alignment. 10M

- Q.3(A) Derive an expression for calculating the OSD on a highway. 10M

OR

- Q.3(B) A vertical summit curve is formed when an ascending gradient of 1 in 25 m another ascending gradient of 1 in 100. Find the length of the summit curve to provide the required stopping sight distance for a design speed of 80 kmph. 10M

- Q.4(A) Explain about the Webster method of signal design. 10M

OR

- Q.4(B) Write a short note on  
i) Desire lines ii) PCU iii) Level of service iv) Parking lot V) O-D studies 10M

- Q.5(A) What are the design elements in a rotary intersection? Discuss their designs 10M

OR

- Q.5(B) Enumerate the various types of intersections and the basic principles involved. 10M

- Q.6(A) Explain the desirable properties of aggregate to be used in different types of pavement construction. 10M

OR

- Q.6(B) Explain the design procedure for design of rigid pavements recommended by IRC. 10M

\*\*\* END\*\*\*

