Answer all the questions.
Support your answers with relevant sketches wherever necessary.
Well drafted and neat sketches shall be given extra credit.

Q.No.   Question                                                                                                    M.M.
1       Explain the following terms in brief: (any five)                                                            [5x3=15]
        (i) Arterial road
        (ii) Cul-de-sac
        (iii) Neighbourhood Planning
        (iv) Utopians
        (v) Ribbon development
        (vi) Pedestrianization
2       What were the implications of industrial revolution on European towns? [15] Explain the development of modern day town planning in the nineteenth and twentieth century.
        ‘OR’—
2’      Explain the socio-economic characteristics of the society during the vedic period in India. [15]
3       Write short notes on the town planning ideas of the following (any two): [2x7.5=15]
        a) Ebenezer Howard
        b) Clarence Stein
        c) Le Corbusier
4       Sketch the layout of a 24m ROW collector street in a residential sector giving preference to pedestrians and curtailing the vehicular movement. Explain the design with the help of following details: [08]
        (a) Plan
        (b) Section [07]
Maximum Marks: 60  
Credits: 04  
Duration: Two Hours

Answer all the questions.  
Assume suitable data if missing.  
Notations used have their usual meaning.

Q.No.  
Question  
M.M.

1  
Explain the five different type of lighting schemes used in the interiors? 

OR

1’  
Differentiate between gas filled lamp and gaseous discharge lamp, explain the efficiency and usage of Sodium Vapour lamp?  

[12]

2  
What are the main components of any air conditioning system, explain them with neat diagram?

OR

2’  
What are the different classifications of Air Conditioning, explain with figure the working of Central Air Conditioning system?

[12]

3  
Explain the following terms:  

A. Stack Effect  
B. Reverberation  
C. Illumination Level  
D. Acoustics

[12]

4  
A conference room is having length 6 m and width 10m, total absorbing power of the panels used as absorbents is 13 m² sabine. Calculate the height of the conference hall if the reverberation time is 3 sec. What would be the area of the conference hall on the calculated height if the reverberation time is 2 sec.

[12]

5  
Sketch on your answer sheet, the electrical layout of an architect’s office with three workstations and size 5m X 8m with attached toilet on the short wall. The size of the toilet is 2m X 3m. Provide the legend of electrical fixtures used and specification chart for the same.

[12]
2016-17
B.TECH. (WINTER SEMESTER) EXAMINATION
ARCHITECTURE
CONSTRUCTION AND MATERIALS-IV
AR-308N

Maximum Marks: 40  
Credits: 05  
Duration: Two Hours

Answer all questions from SECTION A
Assume suitable data if missing.

Q.No.  

Question  

M.M.

SECTION A

1  What is prefabrication? Discuss the environmental benefits of adopting prefabrication.  

[04]

2  What are different types of cracks observed in buildings? Discuss with respect to the reasons of their occurrence.  

[04]

3  What are eaves in pitched roof? Explain the three types of eaves with the help of sketches.  

[04]

SECTION B

4  Draft a section for Double pitched roof.  

[10]

5  Draw a sectional detail for Sliding folding door, which is top hung on a trolley runner.  

[10]

OR

5'  Draft plan of Revolving door in timber, having four compartments, each having a radius of 1m.  

[10]

SECTION C

6  Write short notes on any two of the following. Support with sketches.  

[08]

6 (a)  False Ceiling

6 (b)  Partition Walls

6 (c)  Wall Panelling
Cultural Centre

Design and present a Cultural Centre for a social organisation on a site measuring 120 mts x 180 mts (depth) on a 60 mts wide Agra road on its North opposite Rathi Hospital in Aligarh.

Design the building/site with following features/facilities considering FAR 50 with Maximum ground coverage 40%.

- Spaces and activity zones for indoor and outdoor entertainment area and activities like:
  1. Entrance lounge for 20 people, Banqueting for 200 indoors and 300 outdoors
  2. Kitchens with stores and wash areas
  3. Meeting/Board room for 20 peoples, Audio Visual Lounge for 25 people
  4. Exhibition Hall for Organising industry/Fine Arts/Handicraft work
  5. Auditorium for Stage presentation for performing arts of capacity 250 peoples with ancillary spaces and utilities & public conveniences

Must be Integrated with following:

Manager’s and caretaker’s chambers supported by staff of 6 each.

General Toilet for males and female.

Design Park and Parking for 125 cars and 250 two–wheeler, in the 20 mts. front setback.

*Present your scheme to suggest site layout, park/parking & outdoor (functioning) spaces. [08]
* Floor Plans, two elevations and two sections. [08+08+08]
*Concept(Viva) [08]
Note:
1. Answer all the questions.
2. Assume suitable data if missing.
3. Notations used have their usual meaning.
4. Use of IS: 800 (2007) and steel tables is permissible.

Q.No. Question
1. (a) What is the advantage of using heavily coated electrodes for welding? [01]
1. (b) Name two common defects of weld. [01]
1. (c) A single bolted double cover butt joint is used to connect two 6mm thick plates. Use 20 mm diameter bolts of grade 4.6 provided at a pitch of 60 mm. Calculate the efficiency of joint. Assume the thickness of each cover plate as 4mm. [13]

2. (a) Through diagrams show the use of tension members used in buildings and bridges. [2.5]
2. (b) List the factors affecting the choice of section of compression members. [2.5]
2. (c) Design a column comprising of 2ISMC300 placed toe to toe placed at a total width of 300mm. The column is restrained against translation and rotation at both ends. The length of column is 5m. Use E250. Assume the column to be battened. [10]

3. (a) Explain the role of ITS and Longitudinal stiffeners in a plate girder (Use diagram). [03]
3. (b) A 30m long simply supported welded plate girder carries a uniformly distributed load of 75kN/m excluding its self weight and two concentrated loads of 900kN each at quarter points of span. Assume the girder to be supported laterally throughout the span. Take the width of the support as 500mm. The section of plate girder is as following:

Flanges 540mm×25mm
Web 2100×12mm

Design end bearing stiffener. Check of bearing strength of stiffener as per Clause 8.7.5.2 is not required. Use and list the relevant clauses.

OR

... Contd...
3'. (b) For the data given above with the depth of the web as 2100mm and width of flange as 540mm what changes are required in the other dimensions of these components to design an unstiffened plate girder. Check the adequacy of the section so proportioned against the maximum shear force only. Use and list the relevant clauses.

4. (a) Comment on statement “Shape factor of a rectangular beam is 1.5”.

4. (b) A fixed ended beam as shown in figure below is subjected to a load W at one third of span. Estimate collapse load.

OR

4'. A gantry girder is to be used in an industrial building carrying a manually operated overhead travelling crane, for the following data.

- Crane Capacity: 200KN
- Self weight of crane girder excluding trolley: 200KN
- Self weight of trolley, electric motor, hook etc: 40KN
- Minimum hook approach: 1.2m
- Wheel Base: 3.5m
- c/c distance between gantry rail: 16m
- c/c distance between columns (span of gantry girder): 8m
- Self weight of rail: 300N/m
- Diameter of crane wheels: 150mm
- Yeild stress ratio: 1
- Steel of Grade: Fe 410

Find section modulus for a section to be used.