Enrolment No._____

SARVAJANIK UNIVERSITY

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S-2024 Date: 22-04-24 Time: 09:30 AM to 12:30 PM

Backlog Exam

B.Arch.-III,- SEMESTER– V EXAMINATION

Course Code: BRAR12502 **Total Marks:180**

Course Name: Building Technology III – Advanced Construction, Structure & Services

Instructions:
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q1. Do as directed . Attempt all questions. **36**

1. Passive air conditioning occurs when a building's ventilation and heat control works on it's own by virtue of it's design and spatial planning (True/ false)

2. Full Form of AHU is Air Heating Unit .(True/ false)

3. Sky Scrapers have two systems of elevators , direct express elevators for uppermost floors and local elevators for intermediate floors. (True/ false)

4. Fire lift is always provided separate from Passenger Lift and Goods Lift. (True/ false)

5. Aspect ratio in a tall building is a ratio of 1 : _____to _____of a building .

6. As height of building increases wind load _____.

7. Core & out rigger system alone is enough for any tall building for resisting lateral load .(True/ False)

8. To resist lateral load in a tall building, structural systems are put at periphery. (True/ False)

9. The location on earth directly above the focus is known as _____.

10. Reinforced frame structure building having open parking on the ground floor is risky during earthquakes. (True / False)

11. Intensity of an earthquake remains the same everywhere. (True / False)

12. Instrument measuring earthquakes is known as _____.

13. As per the seismic map of India, zone- V means an area having moderate

earthquakes. (True / False)

14. To withstand earthquake loading, the weakest link in RC frame building should be

    a) beam b) Column c) Slab d) Foundation

15. Which core gives maximum view from periphery of the building floor plate from the following options?

    a.)  b.)  c.)  d.) 

16. Which one is not land reclamation method from the following?
    a. Hydraulic reclamation method
    b. Sand spreading method
    c. Elevation of structure method
    d. Re handling form pit method

17. Which method provides larger span for underground tunneling from the following?
    a) Box Jacking b) Pipe Jacking c) both d) none

18. Slip form technique of construction is used for construction of
    a) Framed tube b) truss tube c) core shear wall d) core & outrigger

Q.2 Explain in brief with sketches. (<u>Any six</u>) **36**

1. Which are the basic lateral load transfer systems & how it works ?
2. What is the difference between effect of wind load & earthquake load on a tall building.
3. What is resonance ? explain with example
4. Explain the difference between Eccentrically braced frame & concentrically braced frame , which system is used where & why ?
5. For designing a tall building in earthquake zone , how a form is designed & why ?
6. Why tube system is used in a tall building ? what are its benefits?
7. Explain diaphragm action of slab in a tall building with example.
8. At mechanical floor level in a tall building what kind of lateral load resisting systems are used & why.

Q.3. Answer any <u>Three</u> questions from following **54**

1. How a building without uniform mass behaves during an earthquake? what measures one can take to correct it.

2. Explain the behaviour of load-bearing structures in earthquakes. How it can be rectified so that the building is safe in an earthquake?

3. What is a soft storey? give practical examples of soft stories in a building. Why and how a building with a soft storey can fail in an earthquake? To resist earthquakes for a soft storey, how the building should be designed?

4. Discuss Factors affecting the design of reinforced concrete buildings in an earthquake zone with shear walls.

Q.4. Answer any Three questions from following **54**

1. Consider a foyer of G +4 Club House with approximate area of 4.5 m x 6 m x 6m. Provide air conditioning for the same with the following considerations :
    a. Which typology of System of Air-conditioning will you suggest?? Give Reason for the same and justify your selection based on typology of space and climatic consideration.
    b. Draw/ sketch, labelled wall section and roof plan showing the distribution channels /ducts for the AC / HVAC System selected along with placement of machines / equipment.
    c. Suggest the ventilation system in such a manner that in absence of active Air-conditioning the space can be cooled with passive means / ventilation systems.

2. Design a metro underpass which must be two way & rectangular in section having height of 6 meter and width of 18 meter as mentioned below.

    a. Design the same with Cut & Cover method & draw its schematic section with all dimensions. Describe the same in detail.
    b. Design the same with box & jacking method & draw its schematic section with all dimensions. Describe the same in detail.

3. Design a central service core for 4 Stretchers Lift, 6 Passenger Lift, Regular stair case, Fire staircase & various services shafts according to 80 stories commercial tall tower as mentioned below.
    a. Draw plan with requirements
    b. Draw elevation to explain/show type of structural systems you have selected.
    c. Draw schematic diagram to show load transfer from super structure to sub structure.

4. Consider an Entrance lobby of Size 25 m x 45 m of a Railway Station to provide Vertical Transportation or Automated Transportation.

    a. Which Types of Vertical / Automated Transportation would you Suggest if the Railway Station is having a Seven Storied Shopping Mall Also . Give Reason for your answer.

    b. Draw a labelled diagram with dimensions (Section & Plan) of the Typology of Vertical Transport selected by you.

    c. State which type of Lifts are best for Physically Challenged People for Vertical Transportation. Sketch / Draw a small foyer which facilitates the same for the Railway Station.