**E.G.S PILLAY ENGINEERING COLLEGE**

**NAGAPATTINAM - 611002**

QUESTION BANK WITH ANSWER

**DEPARTMENT: CIVIL SEMESTER: 08**

**SUBJECT CODE /NAME: CE 2045/PREFABRICATED STRUCTURES**

**YEAR: IV**

**PART – A**

**1.Define progressive collapse. (May/june 2012)(nov/dec 2013)**

progressive collapse occurs when the sudden loss of a critical – load bearing element initiates a chain reaction of structural elemnt failures, eventually resulting in partial or full collapse of the structure.

**2. what are the approaches to avoid progressive collapse?(nov/dec 2012)**

1. redundancy or alternate load path

2. local resistance

3. interconnection or continuity

**3. List the codes and standards for progressive collapse (dec 2013**)

1. ASCE7-02

2. ACI 318-02

3. GSA PBS Facilities and standards 2000

4. GSA PBS facilities standards 2003

5. GSA PBS Progressive collapse guidelines 2003

**4. What are the causes of abnormal loads? (dec 2012)**

1. accidental impact

2. faulty construction

3. foundation failure

4.violent changes in air pressure

**5. Define the term equivalent design loads. (june 2012)(jun 2013)**

In the arrangement the bearing is subjected to generally acting forces in various magnitudes, at various rotational speeds and with different acting period From the point of view of calculation methodology the acting forces should be re-calculated into the constant load, by which the bearing with have the same life as it reaches in the conditions of the actual load.such a re-calculated constant radial or axial load is called the equivalent load.

6. **What is strong column and weak beam concept? (jun 2012)**

* In a building a column is more important than a beam, because it supports the

Load till the foundation. lf a beam breaks it will result in a partial collapse but if a column break it will result in catastrophic failure

* That is the reason why we have to always design our columns stronger than beams.

7. **What is meant by progressive collapse? (may 2015)**

Extreme loading for Structures (ELS) software allows structural engineers to accuratelyanalyze and visualize progressive (disproportionate) collapse resulting from extremeloading conditions including: earthquake loads' severe wind loads' blast loads' dynamicloads and impact loads. Engineers can also determine a structures vulnerability toprogressive collapse by creating multiple event scenarios which will simulate the failure of different components so as to determine whether the resulting collapse will be partial orcomplete.

8. **Mention the term high potential for progressive collapse**

The facility is considered to have a high potential for progressive collapse if analysis results indicate that the structural member(s) and / or connections are not in compliance with the appropriate progressive collapse analysis acceptance criteria.

**9. Define the term connection redundancy and connection resilience**

**Connection Redundancy:**

A beam-to column connection that provides direct, multiple load Paths through the connection.

**Connection Resilience:**

A beam-to-column, connection exhibiting the ability to withstand rigorous and destructive loading conditions that accompany a column removal, without ability is facilitated by the connections torsional and weak-axis flexural robustness, and its primary use of proven ductile properties of a given construction material.

**10. What is meant by allowable extant of collapse?**

The extent of damage resulting from the loss in support of an exterior primary vertical load-bearing member that extends one floor above grade (one story) shall be limited.

**11. Define the term abnormal loads**

Abnormal Loads - Loads other than conventional design loads (dead, live, wind, seismic,

etc for structures such as air blast pressures generated by an explosion or impact by vehicles, etc,

**12. Explain the importance factor and response reduction factor used in static analysis for calculation of design seismic force.(jun 2009**)

The importance factor originated with the seismic base shear equation in the 1976

Uniform Building Code .the concept at that time was that the importance factor increased the design seismic forces in order to provide additional seismic resistance to prevent catastrophic collapse. The Arnerican Society of Civil Engineer's Minimum Design loads for buildings and Other Structures IASCE 7 98) the importance factor Appears in the velocity pressure equation for wind design and in the flat roof snow load equation for snow load design. There are three different importance factors: wind snow and seismic.

**13. What are the types of collapse in progressive structural elements?**

This is a form of domino effect failure that can occur in a reinforced concrete structure whereby a failure starting in a particular component rapidly propagates to other components precipitating a major or even a total collapse.

The three most common occurrences of this type of collapse are as follows:

1. High rise concrete flat-plate structures (during or earthquake)
2. Formwork for concrete structures.
3. High rise structures constructed with precast elements.
4. **What are the provisions made in prefabricated RC floors in a cyclone prone zone?**

* Prefabricated RC elements of various designs placed side by side where as RC slabs are rigid in their own planes, the other types will require their integration through diagonal bracing or topping RC screed [Structural deck concrete].
* Structural deck concrete of grade not lesser than M20 should be provided over precast components to act monolithic with them.

1. **What are the requirements to increase the resistance to progressive collapse?**

o All the multi storey vertical load carrying elements must be capable of supporting

the vertical load after the loss of lateral support at any floor level ( i.e. a laterally unsupported length equal to two stories must be used in the design or analysis).The loads from the '' removed,, storey need ,not be applied to the wall or column.

o All floors and roofs must be able to withstand a prescribed net upward load applied to each bay. The uplift loads are not applied concurrently to all bays. For Medium and high level o f protection.

o All perirneter columns must have sufficient shear capacity to develop the full plastic flexural moment.