UNIT-V
REPAIR, REHABILITATION AND RETROFITTING OF STRUCTURES
PART-A

1.What are the techniques required for repairing cracks?

- Bonding with epoxies
- Routing and sealing
- Stiitching
- Blanketing
- External stressing
- Grouting
- Autogenous healing

2.Define stitching.

The tensile strength of a cracked concrete section can be restored by stitching in a manner similar to sewing cloth.

3.What do you mean by blanketing?

This is the simplest and most common technique for sealing cracks and is applicable for sealing both fine pattern cracks and larger isolated. The cracks should be dormant unless they are opened up enough to put in a substantial paten in which case the repair may be more property termed as “Blanketing”.

4.Define external stressing.

Development of cracking in concrete is due to tensile stress and can be arrested by removing these stresses. Further the cracks can be closed by including a compressive force sufficient to over come the tension a residual compression.

5.Write short notes on Autogenous healing.

The inherent ability of concrete to heal cracks within “autogenous healing”. This is used for sealing dormant cracks such as precast units cracked in handling of cracks developed during the precast pilling sealing of cracks in water hands and sealing of cracks results of temporary conditions.

6. What is overlay?

Overlays may be used to restore a spelling or disintegrated surface or to

protect the existing concrete from the attack of aggressive agents. Overlays used for this purpose include concrete or mortar, bituminous compounds etc. Epoxies should be used to bond the overlays to the existing concrete surface

7.Give short note on Jacketing.

Jacketing consists of restoring or increasing the section of an existing member by encasing it in a new concrete. This method is useful for protection of section against further deterioration by providing additional to in member.

8.Give an account on how metal bonding is done on concrete member.

On the tension side of the beam 2to 3mm steel plates are to the existing beam to increase its capacity. The glue or adhesive should compatible with the existing concrete with behavioral characteristics under load addition to providing integrity with parent member.

9.How clamps are used to overcome low member strength?

The distress is due to inadequate stirrups either due to deficiency in the of provision of C- stamps, U-clamp fixed externally along the length of beam to provide adequate these will be protected by covering with rich mortar or concreting as the a later stage.

10.Define grouting.

Grouting can be performed in a similar manner as the injection of an epoxy. However the use of an epoxy is the better solution except where considerations for the resistance of cold weather prevent such use in which case grouting is the comparable alternative.

11.Give a short note on epoxy coatings.

These are organic compound which when activated with suitable hardening agents form strong chemically resistant structures having excellent adhesive properties. They are used as binders or adhesives to bond new concrete patches to existing surfaces or hand together cracked portions. Once hardened, this compound will not melt, flow or bleed. Care should be taken to place the epoxy within the pot life period after mixing.

12.What are protective surface coatings?

During of concrete can be substantially improved by preventive maintenance in the form of weather proofing surface treatments. These treatments are used to seal the concrete surface ad to inhibit the intrusion of moisture or chemicals.

13.List some materials used as protective surface coatings.

Materials used for this purpose include oils such as linseed oils, petroleum etc.

14.Define dry pack.

Dry packing is the hand placement of a very dry mortar and subsequent tamping or ramming of the mortar into place producing an intimate contact between the old and new concrete work.

15.Give a brief account on routing and sealing.

This method involves enlarging the cracks along its exposed surface, filling and finally sealing it with a suitable material. This is the simplest and most common technique for sealing cracks and is applicable for sealing both fine pattern cracks and larger isolated.

16.List any four causes of cracks?

- Use of unsound material
- Poor & bad workmanship
- Use of high water-cement ratio
- Freezing & thawing
- Thermal effects
- Shrinkage stresses

17.What are the types of cracks?

Class-1: Cracks leading to structural failure
Class-2: Cracks causing corrosion
Class-3: Cracks affecting function
Class-4: Cracks affecting appearance

18.What is pneumatically applied mortar?

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Pneumatically applied mortar is used for the restoration of when the location of deterioration is relatively at shallow depth. It can be used on vertical as well as on horizontal surfaces and is particularly restoring surfaces spalled to corrosion of the reinforcement. Damaged concrete elements also retrofitted using this method. This also has known as gunning or shotcreting techniques

19. What is caging with steel?

A steel caging is prepared and made to surround the existing masonry so that lateral expansion when it is loaded in compression. The confinement of masonry will steel cage increases its capacity and ductility.

20. Give a brief note on dogs in stitching.

The dogs are thin and long and to cannot take much of compressive force. The dogs must be stiffened and strengthened by encasement in an overlay or some similar means.

21.Give some concrete materials used to overcome weathering action on concrete.

The two concrete repair materials used were (*i*) a flow able concrete with 16 mm

aggregate and containing a plasticizer and a shrinkage-compensating additive, to be cast against forms in heights up to 1.5m, and (*ii*) a patching mortar to be applied b rendering, for areas less than .01 m^2.

PART-B

1. Explain the various techniques available for repair of cracks.

2. Explain the various techniques to repair spalling and disintegration of concrete.

3. Describe the various strengthening techniques to overcome low member strength.

3. Explain in detail about Chemical disruption on concrete.

5. Describe in detail about the weathering action on concrete.