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PESHAWAR

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MID TERM EXAM

Question:- 1 part A

Structural material:-

Structural engineering depends on the knowledge of material and their properties in order to understand how different material resist and ~~support~~ support loads.

1- Iron

- ~~iron~~ wrought iron
- cast iron
- steel
- stainless steel

2:- Concrete:-

- Reinforcement concrete
- prestressed concrete

3:- Aluminium

- 4:- Composites
- 5:- Masonry
- 6:- Timber
- 7:- other structural material
- 8:- Reference
- 9:- Further reading.

Part B

What are the factors influencing compressive strength of concrete:-

Compressive strength is the most importance property of concrete. The compressive strength of concrete is determined in the laboratory in controlled condition on the basis of this

test result we judge
the quality of concrete.

There are 5 factors
which influence strength of
concrete when test of
compressive strength.

- 1:- shape and size test specimens
- 2:- Height to diameter ratio
- 3:- Rate and application of load
- 4:- Moisture content in the
test specimens.
- 5:- Material used
for capping.

SHAPE AND SIZE TEST SPECIMENS.

Shape and size specimens
affect and the strength
test result and concrete
to large extent. If

Cube of different size but prepared from the same concrete are tested then they will show different test result for example strength of cube specimen having 10cm in size 10% less than strength of cube specimen have 15cm in size.

HEIGHT TO DIMETER RATIO

Generally for test cylindrical concrete specimen the height to diameter ratio is kept 2. But some time it is not possible to keep the height/diameter ratio equal 2 when the core is cut from road pavement or airfield of any part of structure.

3:- RATE OF APPLICATION OF LOAD:-

Rate of Application load has considerable influence on the strength test result if the rate application of load slow or there some time lag, then it will result lower of value of strength.

4:- MOISTURE CONTENT IN THE TEST SPECIMEN

The presence of Moisture content in the test of Specimen also affect the test result to great extent if two cube (one is wet and another is dry) prepared from the same concrete are test at the same age.

5:- MATERIAL USED FOR CAPPING:-

There are various methods available of capping concrete cylinder such as Sulphur capping ~~and~~ gypsum capping and cement capping etc.

Question:- 2 part = A

Interfacial Transitional Zone
on properties of concrete:-

A parametric study was conducted to explore the effect of interfacial transition zone (ITZ or interphase) on the overall elastic modulus of the CNT reinforced cement. The effect of ITZ properties of the elastic modulus of the CNT reinforced cement and the center of opposite unit cell on interphase an ITZ (or interphase) and cement matrix. The CNT and cement were assumed full elastic while the interphase.

was modeled using Cohesive
 Surface from work with the
 with and mechanical
 properties of the TiZ
 and the interface
 were found to effect
 significantly the elastic
 modulus and the
 behavior of the
 Composite material.

Elastic modulus (E)

GPa $\text{N}(\text{nm})^2$ poisson ratio (ν)

Cement matrix	30	3×10^8	0.20
CNT	1000	1×10^6	= 0.35

PART - B

Thermal properties of Concrete:-

Thermal properties of concrete can be defined as the effect of heat and high temperature of the concrete. These effects are avoided and always vividly spread on the surface of concrete. Some of these effects can be scrutinized material and some quite abstract.

Thermal properties of concrete can be subdivided into:-

Thermal properties of concrete can be subdivided into thermal conductivity, thermal diffusivity, specific heat, thermal expansion, and thermal shrinkage.

Thermal Conductivity:-

Thermal Conductivity is a measure of the ability of concrete to conduct heat. It is defined as the ratio of flux of heat to the temperature gradient. Thermal conductivity is measured in joules per second per square meter of area of body when temperature difference of 1°C per meter thickness of body.

Thermal Diffusivity:-

Thermal Diffusivity is a measure of which temperature change within mass takes place. It is related to the conductivity (k) of the following equation.

Question No 3

Part = A

1 Define and explain Failure Mode in Concrete.

Failure mode in reinforced concrete beams are also classified into major type flexural failure and shear failure.

The former occurs when the imposed load exceeds the flexural capacity of the material of the beam while the latter occurs due to deficiency in shear resistance b/w different material of the beam.

Failure mode in reinforced concrete beam are classified into two major type.

flexural failure and shear failure. The former occurs when the imposed load exceeds the flexural capacity of the beam while latter occurs due to deficiency in shear resistance b/w different material of the beam.

these failure mode are further divided into different kinds of failure the former is categorized into tension failure and compression failure and balanced failure where shear failure is categorized into tension shear.

exist around aggregate
rock sand (particles)
in concrete this mainly
because the cement past
mixes in itself particles
when the cement grain
encounter the wall of
aggregate region of
higher proximity near the
aggregate surface will
appear due to the packing
constraint imposed by the
aggregate surface [1, 2]
Because the average aggregate
diameter the aggregate
of average will affect
locally fall to the
cement grain.