***Iqra national university Peshawar***

***Subjects : CONCRET TECHNOLOGY***

***B,TECH SECOND SEMESTER***

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***Q1(a)***

*Concrete as neither as strong is nor tough as sted but widely used as engineering material because of some basic resion which are ; ;*

*\*****\*RESISTENCE TO WATER.****.*

*Concrete processes on excellent resistence to water .unlike wood an ordinary steel, the ability of concrete to with stand the action of water without serious deterioralion more at an ideal material for widely used.*

*\*\*****EASE OF WORK****.*

*The ease with which concrete element can be form into a veriety of shape and size.concrete can be easily moulded into desires shape and size.*

*\*\*****CHEAPEST MATERIAL.***

*Concrete as the most cheapest material and easily available and every where .the main component of concrete which are aggregates , Portland cement and water are cheap and available and every where.*

***Q1(b)***

***FACTORS INFLUENCING COMPRESSIVE STRENGHT OF CONCRETE .***

*There are five factor which influence strength of concrete when tested for compressive strength these factor are mentioned below ..*

*\*Shape and size of test specimens hight to diameter ratio rate of application of load moisture content and the test specimen. Material used for capping*

***(1) Shape And Size Of Test Specimens.***

*Shape and size of specimens effect the strength test result of concrete are to a large extent .*

*If two cubes of different sizes but prepared from the same concrete are tested then they well show different test resuts .for example strength of a cube specimens having 10cm and size is 10percent lessthan strength of a cube specimen having 15cm size .*

*If two cube of different shape /(such as cube and cylinder) are tested then they will show different test result .from experiment it has being found that strength of the cylinder of size 15cm diameter and 30cm long equal to 0.8 time the strength of 15cm cube…*

***(2). HEIGHT TO DAIMETER RATIO***

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

*If the length of the core as too long at can be trimmed to h/d ratio of 2;1 before testing .but if the length of core specimens is short at is necessary to apply correction factor to the test result*

*A correction factor according to the height/diameter ratio of the specimens after capping as obtained from the curve as shown below.*

*Correction factor for height diameter ratio of a core correction factor for height diameter ratio of a core .*

*The product of this correction factor and the measured compressive strength give the corrected compressive strength .this corrected compressive strength is equivalent to the stenght of a cylinder having height /diameter ratio of 2 .*

***(3).RATE OF APPLICATION OF LOAD***

*Rate of application of load e strength has considerble influence on the strength test result.if the rate of application of load as slow are there as some time leg..then at will result into lower value of strength the reson behind this as creep.due to slower application of load the specimen will under on some amount of creep which as turn increases the strain as responsible for pailure of test sample resulting lower strength values.*

1. ***MOISTURE CONTENT IN THE TEST SPECIMEN***

*The presence of moisture content in the test specimens also affect the test result to agrate axtent .if to cube (one as wet and another as dry ) prepared from the same concrete or tested it the same age then the dry cube will give the higher strength then the wet cube .this maybe caused due to the reduction of cohesion of concrete and gradients due to presence of water /*

*To get reproducible results at as advice that the concrete cube or cylinder should be tested immediately on removel from the coring tank because if you tested concrete in dry condition then the tested result well very larg****ly .***

1. ***MATERIAL USED FOR CAPPING***

***T****here are various method avalaible for capping concrete cylinder such as sulphur capping ,gypsum capping and cement morter capping etc(click here to know more about6 capping) the type of capping material used has also some amount of affect on the value obtained from strength test so it as suggested that for a particular construction project the method of capping concret cylinder should be one . in this one method should not be change it any time by in fluing this method we can avoid wide variation and test results and can judge the quality of concrete …….*

***Q2(A) MICRO STRUCTURED OF HYDRATED CEMENT PASTE***

*Micro structured obtained as the weld cools from the liquid paste to ambient tempreture is called the as deposited are primary micro structure at major component include allotrimorphic ferrite widmanstattel ferrite and circuler ferrite. There may also be some martensite retoined austenite or generate pear .these latter phases occure an very small fraction and are known by the collective term micro phases bainite consisting of sheaves of parrellel platelets as not generally found as well designs welding allois instead a circuler ferrite as induced to nucleate heterogeneously on nan metallic influgions .*

*In practice the gap between component to be joint obtained as to for thick steels be filled by a sequence of a several wel deposite these multirun welds have a complicated micro structure the deposition of each sucssive layour heat treats the underlying microstructure some of the region of original primary micro structureare reheated to tempreture high enough to causes the reformation of austenite which during the cooling part of the thermal cycle trasnsporm into a different microstructure other region may simply be tempered by the deposition of sub sequent runs stop the micro structure of the reheated region as called the reheated are secondry microstructure .*

***Q2 . B) THERMAL PROPERTIES OF CONCRETE***

*ANS… Thermal properties of concrete can be defined is the effect of the heat in high temperature concrete these effect are varied and always vividly spread on the surface of concrete some of these effect can be scrutinized materially and some are quit abstract.*

1. *Concret is a material used in all climatic regions for all kind of structure .thermal proratperties of important and structure in which tempreture differential occure including those due to soler radiatioin during costing and the inherent heat of hyderation .*
2. *Knowledge of themal expenssion is require in longspan bread bridge girders, high rise building subject t o variation of tempreture and calculating thermal strains in construction joint is dealing with desingh of concrete dams and in host of 0ther structure where concrete well be subjected to higher tempreture such as fire subsequent colong resulting is crack ,los of serviceibility and duribeality .*
3. *The thermal properties are concrete are more complex than those of most other material because these are effected moisture content ..*

***Question No 3.***

***A)***

***Ans . pre- stressed concrete***

*Most of the mega concrete project are carried out through free stressed concerted units. The is the special technique in which the bars or the tendons used in the concrete is stressed before the equal service lode application.*

*During the mixing in the placing of the concrete. these tensioned bars placed firmly and held from each end of structural unit.once the concrete sets and harden the structural unit will be put in negative force.*

*The phenomena of free stressing will make the lower section of the concrete member to be stronger again the tension .*

*The process of pre stressing will require heavy equipment and labor skill jacks and equipment for tensioning .these are used in the application of bridges heavy loaded structure and roof with longer spans* ***.***

***b)***

***Ans . Reinforced concrete***

*Reinforced concrete (RC) (also called reinforced cement concrete or RCC) is a composite material in which concrete's 6relatively low tensile strength and ductility are counteracted by the inclusion of reinforcement having higher tensile strength or ductility.*

***c) NORMAL STRENGHT CONCRETE***

*the concrete that IS OBTAIND By mixing the basic ingredients cements water and aggregate will give us normal strength concrete the strength of three type of concrete will very from 10 Mpa to 40Mpa*

*The Concrete strength concrete has an initial setting time of 30 to 90 minutes that is defended of on the cement properties and the weather condition of the construction site.*

*The strength of concrete is commonly stated in metric in mega*

*pascals (Mpa).*

*One Mpa = 1,000,000 = 1,000,000 newtons/*

*Pressure = force per area*

*Pressure can be measure in pascals (Pa). 1Pa = 1N/*

***Q3( B )***

***INTERFACIAL TRANSITION ZONE CONCRETE***

***ANS..*** *In fresh concrete water cement ( w:c) ratio gatradient develops around the aggregate particals during casting ,resulting in a different microstructure of the surrounding hyd*

*rated cement paste. This zone around the aggregate is called the interfacial transition xone (ITZ). This review describe the the formation mechanism and the micro structure of the ITZ the higher w:c implies a diffusion process during hydration and this zone maybe consequently describe is a heterogenius area with a porosity gradient and a complementary gradient of in hydrous and hydrated phases. By using very fine and well –dispered menral addition , the initial w;c gradient around the aggregateds is lowered and the ITZ is densified .the micro structure of the ITZ maybe improved in the vicinity of calcareous aggregate , which react with calcium aluminates of Portland cement paste forming calcium carboaluminates . the oveall engineering properties of concrete an relation to the ITZ are beyond the scope of this review never theless ,the local properties of the interfacial zone are reviewed : mechinical and the transport characteristics of the ITZ are discussed relation to the porosity and connectivety of pores …*

*( The end)*