**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI**
**(END SEMESTER EXAMINATION)**

**CLASS: B.ARCH** **SEMESTER : V**
**BRANCH: ARCHITECTURE** **SESSION : MO/18**

**SUBJECT: AR5405 CONCRETE STRUCTURE**

**TIME: 3.00 HOURS** **FULL MARKS: 60**

**INSTRUCTIONS:**
**1. The question paper contains 7 questions each of 12 marks and total 84 marks.**
**2. Candidates may attempt any 5 questions maximum of 60 marks.**
**3. The missing data, if any, may be assumed suitably.**
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
**5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.**

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Q.1 Explain the followings: [4x3]
(a) Fineness Modulus (b) Grading of Aggregate (c) Water-cement ratio

Q.2 Write notes on working stress method, ultimate load method and limit state method of design With their merits and demerits. [12]

Q.3(a) Design a balanced singly reinforced concrete beam section for an applied moment of 60 KN.m. The width of beam is limited to 150 mm. Use M20 concrete and mild steel bars. [12]

Q.4 Design a R.C.C slab for a room having inside dimensions 3m X 7m. The thickness of supporting wall is 300 mm. The live load on the slab is 3 KN/$m^2$. Assume slab to be simply supported at the ends. Use M20 concrete and Fe415 steel. [12]

Q.5 Design a short circular column with helical reinforcement to carry an axial load of 1000 KN. Use M20 concrete and Fe415 steel. [12]

Q.6 Design an isolated square footing of uniform thickness for a column having a vertical load of 800 KN and base size 500mm x 500mm. The safe bearing capacity of soil is 120 KN/$m^2$. Use M20 concrete and Fe415 steel. [12]

Q.7) Design a dog-legged stair for a building in which the vertical distance between the floors is 3.6 m. The stair hall measures 2.5m X 5m. The live load may be taken as 2.5 KN/$m^2$. Use M20 concrete and Fe415 steel. [12]

**:::::30/11/2018:::::E**