Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination – June – 2017**

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| **Code :** | **14CE3008** | **Duration :** | **3hrs** |
| **Sub. Name :** | **EXPERIMENTAL TECHNIQUES AND INSTRUMENTATION** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | Explain the construction and working principles of  (i) Strain gauge load cells.  (ii) column type.  (iii) shear type. | CO1 | 15 |
| b. | Is it necessary to caliberate an Instrument. Justify. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Elaborate on experimental planning and its methodology. | CO1 | 15 |
| b. | Discuss the basic characteristics of measuring devices. | CO1 | 5 |
| 3. | a. | Explain the construction and the working principle of :   1. Tuckermann’s gauge and 2. Tinius olsen extensometer. | CO1 | 15 |
|  | b. | In a direct tension test on a plastic strip, the strain was measured using Moire Technique. Density of grids used is 70 lines/ mm. At the point of observation, the spacing of fringes parallel to gridlines was 50mm. Calculate tensile strain in the specimen. | CO3 | 5 |
| (OR) | | | | |
| 4. | a. | Discuss in detail the different types of bonded and unbounded metallic strain gauges with diagrams. | CO3 | 15 |
|  | b. | Discuss on the Pneumatic displacement gauge with neat sketches. | CO1 | 5 |
| 5. | a. | Explain the working principle of cathode ray oscilloscope with neat sketches. | CO1 | 12 |
|  | b. | Discuss the electro hydraulic vibration generator with neat sketch. | CO1 | 8 |
| (OR) | | | | |
| 6. | a. | Discuss the seismic instruments used for measuring structural vibrations. | CO1 | 12 |
|  | b. | Discuss on the data acquisition and processing system. | CO1 | 8 |
| 7. | a. | Explain the necessity to carry out wind tunnel studies for a structure and brief its working principle with neat sketches. | CO1 | 12 |
|  | b. | Discuss the bourdon tube pressure gauge and manometer with neat sketch. | CO1 | 8 |
| (OR) | | | | |
| 8. | a. | Explain the direct and indirect model method of Model Analysis. | CO2 | 10 |
|  | b. | Explain the reasons for the chloride attack and with the suitable experimental method to determine chloride attack. | CO3 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain in detail the methods to detect corrosion in concrete structures using half cell potential measurements. | CO3 | 8 |
|  | b. | Discuss the accelerated curing test to predict the 28 days strength of concrete. | CO3 | 8 |
|  | c. | Brief the limitations of Pulse-Echo method. | CO1 | 4 |