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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

**End Semester Examination – April/May – 2017**

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

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | Explain the construction and working principles of  (i) Proving ring.  (ii) Pressductor.  (iii) Hydraulic load cell. | CO1 | 15 |
| b. | Explain in detail the types and sources of errors in measurements. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Explain the procedure and principle behind the operation of UTM with suitable sketches. | CO1 | 15 |
| b. | Discuss the experimental data analysis method. | CO1 | 5 |
| 3. | a. | Explain the construction and the working principle of   1. LVDT. 2. Mechancial dial indicator and their applications with neat sketches. | CO1 | 15 |
|  | b. | List the characteristics of strain gauges. | CO1 | 5 |
| (OR) | | | | |
| 4. | a. | A rectangular rosette is mounted on a steel plate having E = 2 x106 N/mm2 and µ = 0.33. The three strains are measured as,  ε1 = 600 µ m/m  ε2 = 500 µ m/m  ε3 = -200 µ m/m  Calculate the principal strains and stresses and the maximum shear stress. Locate the axis of principal stress. | CO2 | 15 |
|  | b. | Discuss on the Fiber optic sensors and their types with neat sketches. | CO1 | 5 |
| 5. | a. | Explain (i) Piezo electric accelerometer.  (ii) Electrodynamic velocity transducer. | CO1 | 12 |
|  | b. | Describe the Characteristics of structural vibrations. | CO1 | 8 |
| (OR) | | | | |
| 6. | a. | Explain various aspects of shock table. | CO3 | 8 |
|  | b. | Demonstrate the servo accelerometer with neat sketch. | CO2 | 8 |
|  | c. | Elaborate on Seismographs. | CO2 | 4 |
| 7. | a. | Explain the working principle of   1. Venturimeter . 2. Pitot tube . 3. Rotometer and. 4. vortex flow meter with neat sketches. | CO1 | 12 |
|  | b. | Express the principles of similitude. | CO2 | 8 |
| (OR) | | | | |
| 8. | a. | State Buckingham’s π theorem. Why this theorem is considered superior over Reyleigh’s method for dimensional analysis. | CO2 | 8 |
|  | b. | Predict out the causes for the structural cracks in a building. | CO3 | 8 |
|  | c. | List any two instruments used for measuring the cracks. | CO1 | 4 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain any 3 NDT test to determine the strength of the concrete structure with neat sketches. | CO3 | 12 |
|  | b. | Describe the causes for corrosion in the structure. | CO3 | 8 |

ALL THE BEST