Name of Program-PhD
Course Name - DSE- CIVIL ENGINEERING)
Course Code - CE20P104

Max. Duration: 1.5 hrs

Max. Marks: 30

Section A

1. Objective Type Questions (ALL QUESTIONS ARE COMPULSORY) (1X5=5)

A Which of the following is a strain-measuring technique using electrical strain gauges?
   i) Piezoelectric Measurement
   ii) Strain Rosette Measurement
   iii) Load Cell Measurement
   iv) Optical Fiber Measurement

B What is the primary function of actuators in smart materials?
   i) Detect environmental changes
   ii) Convert electrical signals to mechanical motion
   iii) Process data
   iv) Transmit wireless signals

C Which material is commonly used in actuator systems?
   i) Silicon
   ii) Piezoelectric Ceramics
   iii) Graphite
   iv) Stainless Steel

D What type of sensor is best suited for temperature monitoring?
   i) Strain Gauge
   ii) Thermocouple
   iii) Accelerometer
   iv) Pressure Transducer

E What is signal processing used for in smart materials?
   i) Amplify mechanical motion
   ii) Filter and analyze sensor data
   iii) Improve material durability
   iv) Provide energy to actuators

Section B

2. Short Answer Type Questions (Attempt any THREE) (3X5 =15)
   a) List and explain the various applications of IoT in civil engineering.
   b) Describe the primary features of AutoCAD for drafting in civil engineering.
   c) Explain the role of STAAD PRO in structural design and analysis.
   d) Discuss how Primavera is utilized in construction management.
   e) Explain the applications of SAP 2000 and ETABS in structural design.

Section C

3. Long Answer Type Questions (Attempt any ONE) (1X10 =10)
a) Compare and contrast the functionalities of ETABS, STAAD PRO, and SAP 2000 in structural analysis.

b) Discuss the role of BIM software such as Revit Structure in enhancing construction efficiency and accuracy.