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**SRK/KW/14/7080**

**Faculty of Engineering & Technology**  
**Fifth Semester B.E. (Mechanical Engg.)**  
**(C.B.S.) Examination**

**MECHANICAL MEASUREMENT AND**  
**METROLOGY**

**Time—Three Hours]**

**[Maximum Marks—80**



1. (a) Represent the technique of temperature measurement by a thermocouple as a generalised measurement system. Identify the various elements and functions performed by each element. 7
- (b) List the different methods of corrections of undesired inputs. Explain the methods of signal filtering with suitable example. 6

**OR**

2. (a) What do you mean by zero drift ? How is it different from sensitivity drift ? Explain both with suitable example. 6
- (b) Describe the working of resistive potentiometer for linear measurements, with suitable sketch. Discuss the advantages and disadvantages of the same. 7
3. (a) Describe with neat sketch photoelectric transducer for speed measurement. 6
- (b) Explain with neat sketch construction and working of Prony-Break Dynamometer. 7

**OR**

4. (a) Describe the working of resistive potentiometer for linear displacement, with suitable sketch. Discuss the advantages and disadvantages. 7
- (b) Explain with a neat sketch the working of hydraulic load cell. 6

5. (a) Explain the construction and working of carbon microphone with neat sketch. State its application. 7
- (b) Draw neat sketch of Ionization gauge for low pressure measurement and explain its working. Discuss advantages and disadvantages. 7

**OR**

6. (a) Explain with neat sketch construction and working of Resistance Temperature Detector. 7
- (b) Explain with neat sketch the working of Knudsen gauge. 7
7. (a) Define tolerance. Give classification of tolerance. What is tolerance accumulation ? How can it be avoided ? 6
- (b) Why are slip gauges termed as end standards ? How line standards is converted into end standards ? 7

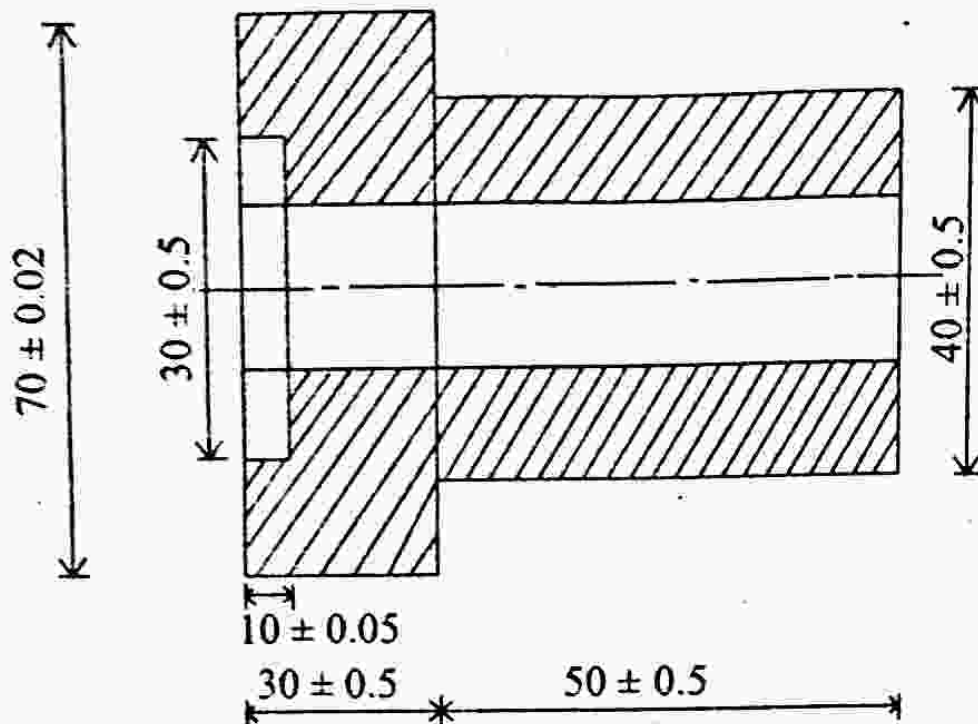
**OR**

8. (a) Give experimental set-up for measurement of taper angle with the help of sine bar. Explain in brief why it is not preferred for more than  $45^\circ$ . 7
- (b) Explain selective assembly in detail. 6
9. (a) Describe the different types of fits with neat sketches. 5
- (b) Design GO and NOT GO gauges for checking a hole and shaft pair designated by  $40H_7/d_{11}$ . Draw dimensioned sketches of gauges. Assume gauge maker's tolerance is 10% of work tolerance. 8

**OR**

10. A part is to be manufactured as shown in Fig. 1. Prepare the plan of manufacturing of this part in terms of (i) Material selection, (ii) Simplified process planning sheet, (iii) Tolerance chart for longitudinal direction.

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**Fig. 1**

11. (a) Explain working of Tool Maker's microscopes with neat sketch. 7
- (b) What is comparator ? Explain Reed type mechanical comparator. State its advantages and disadvantages. 7

**OR**

12. (a) What is optical flat ? Explain how interference fringes are formed when optical flat is placed on a surface to be used. 7
- (b) Explain two wire method of measuring the effective diameter of screw threads. 7