B.E. (Mechanical Engineering) Fifth Semester (C.B.S.)

Mechanical Measurement & Metrology

P. Pages : 2 **TKN/KS/16/7430**

Time : Three Hours * 0 8 6 5 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data wherever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.
11. Use of non programmable calculator is permitted.
12. Use of Design data book is permitted.

1. a) Draw a block diagram of a generalized measurement system and explain it. Identify the various elements of piston type pressure gauge. **7**

b) Explain the following terms as related to dynamic characteristics of an instrument. **6**
i) Speed of response and measuring lag.
ii) Fidelity and frequency response.
iii) Dead time and Dead zone.

OR

2. a) Enlist methods of correction of undesired input, discuss with suitable block diagram and Explain method of opposing input. **7**

b) Explain in brief. **6**
i) Accuracy and precision.
ii) Threshold and resolution.
iii) Range and span.

3. a) Explain construction and working of prony brake dynamometer. **7**

b) Explain the working of fly ball type mechanical tachometer with neat sketch. **7**

OR

4. a) Write note on Hydraulic Load cell and give its characteristics. **7**

b) Describe the working of resistive potentiometer for linear measurements with suitable sketch. Discuss advantages and disadvantage of the same. **7**

5. a) Explain construction and working of thermocouples. Describe the thermoelectric laws. **6**

b) Draw and explain ionisation gauge for low pressure measurement and discuss advantages and limitations. **7**

OR

6. a) Sketch and explain the working of capacitor type microphone. **7**

b) Write note on LDR. **6**

7. a) Differentiate between line and end standards. Why slip gauges are termed as end standards. **7**

b) Define flatness. Describe optical flat used for measuring flatness. **6**

OR

8. Write short notes on. **13**

i) Interchangeable manufacture.
ii) Selective assembly.
iii) Sine bars.

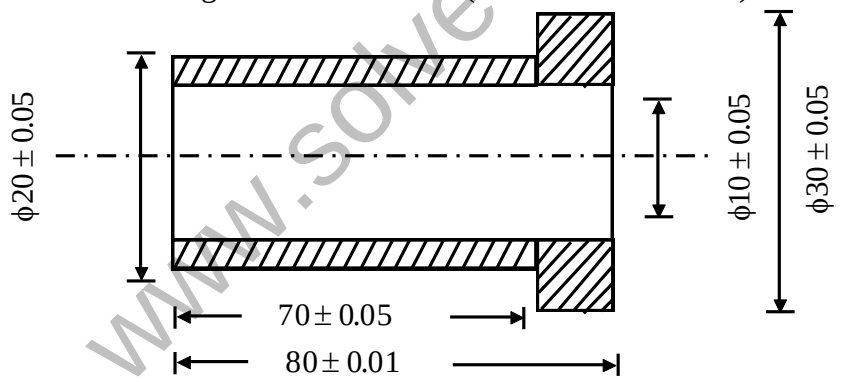
9. a) Design a general 'Go' and 'NOGO' gauges for 25 H_7F_8 shaft and hole pair. **10**

b) Write short note on shaft basis and hole basis system. **4**

OR

10. Prepare a plan of manufacturer for the part shown in fig. in term of **14**

i) Selection of the raw material size.
ii) Selection of the principal process operation.
iii) Simplified process planning sheet.
iv) Tolerance chart for longitudinal dimension (all dimension in mm).



11. a) Describe with neat sketch the principle and working of an auto-collimator. What are its applications. **7**

b) Write short note on two wire method of measurement of screw thread. **6**

OR

12. a) What are the types of comparators? Explain with neat sketch optical comparator. **7**

b) Explain constant chord method for gear tooth measurement. **6**

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