T.E (Production Engineering)(SEM-V)(Choice Base)/Nov 2019/27.11.2019

(3 Hours) **(Total Marks: 80)**

N.B.: 1. **Question No.1** is **Compulsory**.
2. Attempt **any three** questions out of the remaining **six** questions.
3. Assume suitable **data** if **required**.
4. **Figures** to the **right** indicate **full marks** to that question.
5. Support your answers with appropriate **sketches** wherever **required**.

Q.1. Attempt **any four** questions of the following. **(20)**

a) List the classification of comparators.

b) Explain in brief quality of design and quality of conformance.

c) Distinguish between Accuracy and Precision with an example.

d) Explain any five surface roughness parameters.

e) Explain with neat sketch principle of interference of light

Q.2. a) Explain with neat block diagram 3D coordinate measuring machine. **(10)**

b) What do you mean by best wire size diameter? Derive an expression for the same in case of screw threads (by Three wire Method) **(10)**

Q.3. a) Briefly explain with neat sketch principle, construction, working and applications of Laser Interferometer. **(10)**

b) Explain the concept of cost of quality. Write a note on prevention, appraisal, failure costs and hidden cost of quality with examples. **(10)**

Q.4. a) What do you understand by Process Capability? Explain its significance with suitable examples. **(10)**

b) Plot Control Chart by Variable for the following data. ($\bar{X}$ and R Charts) **(10)**

	Sub Group Number			
Sample Number	1	2	3	4
1	92	93	93	95
2	91	94	93	95
3	90	96	93	92
4	91	94	93	92
5	92	98	94	95

$A_2 = 0.577,\ D_3 = 0,\ D_4 = 2.115$

Q.5. a) Design workshop type Go – NO Go Gauges for Hole and shaft size 90 H8/e9. **(10)**

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Size 90 mm falls in diameter steps 80 and 100.

Value of unit tolerance (i) = $0.45 \sqrt[3]{D} + 0.001\ D$

Tolerance grade IT 8 and IT 9 are 25i and 40i respectively.

Fundamental deviation for 'e' shaft = $-11D^{0.41}$

b) Explain Bench Marking and its significance **(05)**

c) Briefly explain the Principles of TQM. **(05)**

Q.6. Write short notes on **any four** from the following **(20)**

a) ISO:9001

b) Interchangeability

c) Sampling inspection and its significance.

d) Double Sampling Plan

e) Errors in Gear
