

T.E./Insem.-610
T.E.(Mechanical)
METROLOGY & QUALITY CONTROL
(2015 Pattern) (Semester - I)

Time : 1 Hour]

[Max. Marks :30

Instructions to the candidates:

- 1) *Answer Q.1 or Q.2, Q.3 or Q.4 & Q.5 or Q.6.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw neat diagrams wherever necessary.*
- 4) *Assume suitable data, if necessary.*

- Q1)** a) Explain different types of errors in the measurement. [6]
b) Explain the term 'Calibration. Why it is required? What is traceability.[4]

OR

- Q2)** a) Define the terms: Straightness, Flatness, Squareness, Roundness. [4]
b) Design a general purpose Go-No Go plug gauge for checking hole of diameter 70H8.

Use: • $i = 0.45\sqrt[3]{D} + 0.001D$

• $IT\ 8 = 25i$

• Diameter steps – 50 – 80mm

• Gauge tolerance = 10% of work tolerance

• Wear allowance = 10% of gauge tolerance

Draw & label the sketch indicating tolerance zones & sizes. [6]

- Q3)** a) What is a comparator? Explain with a neat labelled sketch, construction, working, advantages & limitations of Johanson Mikrokatar. [6]

- b) Calculate the effective dia. for M24×3 screw plug gauge by using floating carriage micrometer for which readings were taken as below- [4]

i) Diameter of standard cylinder = 22.001 mm.

ii) Micrometer readings over standard cylinder with two wires of same diameter was = 12.9334 mm.

iii) Micrometer readings over plug screw gauge & same wires was = 12.1124 mm.

Best size wire was used for above measurement. Neglect rake & compression errors.

P.T.O.

OR

- Q4)** a) Explain with a neat labelled sketch, construction, working & applications of
of
i) Parkinson gear tester [3]
ii) Profile projector [3]
b) Calculate the constant chord length & its distance below the tooth tip for gear of module 5mm & pressure angle 20° . [4]
- Q5)** a) Explain with a neat labelled sketch, construction, working, advantages, limitations & applications of co-ordinate measuring machine. [6]
b) Explain machine - vision system with advantages & applications. [4]

OR

- Q6)** a) What is Interferrometry? Explain with neat sketch, construction and working of NPL flatness interferrometer. [6]
b) What is LASER? How it is useful in metrology? State the applications. [4]

