Total No. of Questions : 4]

SEAT No. :

P5435

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S.E. (Automobile & Mechanical) (Mechanical Sandwich) (Automation & Robotics) (Insem)

ENGINEERING MATERIALS AND METALLURGY

(2019 Pattern) (Semester-III) (202044)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) ***Attempt Q.1 or Q.2, Q.3 or Q.4.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if Necessary.***
5) ***Use of electronic pocket calculator is allowed.***

Q1) a) Draw the following planes in cubic crystal system. **[6]**

i) (101)

ii) (100)

iii) (111)

b) Calculate planar atomic density of SC, BCC and FCC on (100) Plane. **[9]**

OR

Q2) a) Compare between ductile and brittle fracture. **[7]**

b) What is cold working? Why Annealing is required after cold working. Explain recovery, recrystallization and grain growth during annealing process. **[8]**

Q3) a) Define formability. Draw Erichsen Cupping test diagram. What do you mean by 'Radial' and 'Circumferential' cracks observed after testing. **[6]**

b) What do you mean by non-destructive testing? Enlist the NDT methods. Explain ultrasonic method of testing. **[9]**

OR

Q4) a) Compare between scanning and transmission electron microscopy on the basis of following points: block diagram, working principle, 'imaging' process, magnification, use & disadvantages. **[7]**

b) Explain how microscopic and macroscopic examinations are useful in investigating failure analysis in metals. Explain spark test in detail. **[8]**

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