



C16-EE-105

# 5036-A

## BOARD DIPLOMA SUPPLEMENTARY (INSTANT) EXAMINATION, (C-16)

JUNE - 2019

### DEEE - FIRST YEAR EXAMINATION ELECTRICAL ENGINEERING MATERIALS

Time : 3 Hours]

[Total Marks : 80

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PART - A

2×15=30

- Instructions :**
- (1) Answer any 15 questions.
  - (2) Each question carries 2 marks.
  - (3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

- 1 State the advantages of ACSR.
- 2 A resistor has a colour band sequence Green, blue, brown and silver, find its resistance value.
- 3 State any four properties of aluminium.
- 4 Write applications of tungsten.
- 5 Define semiconductors.
- 6 What is meant by doping in semiconductors ?
- 7 List factors affecting insulating resistance.
- 8 Write applications of impregnated paper.

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- 9 Give the permittivity of the following dielectrics :
- (i) Air
  - (ii) Bakelite
  - (iii) Glass
  - (iv) Mica
  - (v) Paper
  - (vi) Porcelain
- 10 What are the factors affecting dielectric loss ?
- 11 Define Magnetostriction.
- 12 State Steinmetz equation.
- 13 What is meant by soldering ?
- 14 Write applications of thermocouples.
- 15 Define fusing current.
- 16 Classify the special purpose materials.
- 17 What is trickle charging ?
- 18 A battery of 40 cells is to be charged from a 180V supply. The internal resistance of each cell is  $0.05\Omega$  and the charging current is to be 4A. If the average e.m.f. of each cell during charge is 2.5V, what should be the value of series resistance ?
- 19 State active materials of Nickel-Cadmium cells.
- 20 Compare primary and secondary cells.

**PART - B****10×5=50**

- Instructions :**
- (1) Answer any **FIVE** questions.
  - (2) Each question carries **TEN** marks.
  - (3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

- 21** (a) Explain the effects of Hardening and annealing on copper with regard to electrical and mechanical properties. **5**
- (b) Write applications of carbon. **5**
- 22** (a) State the properties of Mercury. **5**
- (b) State the properties of conducting materials. **5**
- 23** (a) Discuss briefly about holes and its movement. **5**
- (b) Distinguish between P and N type semiconductors. **5**
- 24** (a) What are the properties of mica ? **5**
- (b) Write applications of glass. **5**
- 25** (a) State the applications of dielectrics in capacitors. **5**
- (b) Classify Magnetic materials on the basis of relative permeability. **5**
- 26** (a) Explain hard magnetic materials. **5**
- (b) Explain construction and working principle of bimetals. **5**

- 27 (a) A discharged battery is put on charge 5A for 3.5 hour at a mean charging voltage of 13.5V. It is then discharged in 6 hours at a constant terminal voltage of 12V through a resistance of R ohm. Calculate (i) the value of R for an ampere hour efficiency of 85% (ii) Watt-hour efficiency. 5
- (b) Write the chemical equations during charging and discharging of Nickel-iron cell. 5
- 28 (a) Difference between maintenance of free batteries and lead acid batteries. 5
- (b) Explain indications of fully charged lead acid batteries. 5
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