

B.E. Mining Engineering Sem-III (CBS + C.B.C.S. Pattern)
MN304 / 3BEMN03 - Mine Electrical Engineering

P. Pages : 2

Time : Three Hours



GUG/S/19/11523

Max. Marks : 80

- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answers wherever necessary with the help of neat sketches.
 5. Use of non programmable calculator is permitted.

1. a) Describe briefly Ring main distribution system. **8**
- b) The insulation resistance of a single core cable is $495 \text{ M}\Omega$ per km. If the core diameter is 2.5 cm and resistivity of insulation is $4.5 \times 10^{14} \text{ }\Omega \text{ cm}$, find the insulation thickness. **8**

OR

2. a) What is the purpose of an overhead transmission line? How are these lines classified? **8**
- b) Discuss the different ways of classifying the sub-stations. **8**
3. a) Describe some of the important types of tariff commonly used. **8**
- b) The monthly readings of a consumer's meter are under. **8**
Maximum demand = 60 kW
Energy consumed = 24,000 kWh
Reactive energy = 15600 kVAR

If the tariff is Rs. 20 per kW of maximum demand plus 3 paise per unit plus 0.1 paise per unit for each 1% power factor below 85%, calculate the monthly bill of the consumer.

OR

4. a) A single phase motor connected to 400V, 50Hz supply takes 40A of a power factor of 0.8 lagging. Calculate the capacitance required in parallel with the motor to raise the power factor to 0.9 lagging. **8**
- b) Why is there phase difference between voltage and current in an a.c. circuit? Explain the concept of power factor. **8**
5. a) Explain the construction and working of MOSFET. **8**
- b) Explain the action of an SCR as a switch. What are the advantages of SCR switch over a mechanical or electro – Mechanical switch? **8**

OR

6. a) What are advantages and disadvantages of electric breaking. **8**
- b) Briefly discuss the factor which determine the choice of an electric motor for a specific derive. **8**
7. a) Derive condition for maximum efficiency for a single phase transformer. **8**
- b) Write short note on short circuit test. **8**

OR

8. a) Draw a phasor diagram for lagging power factor for single phase transformer. **8**
- b) Draw and explain oil circuit breaker. **8**
9. a) Discuss and explain working of half wave rectifier. **8**
- b) Explain working of π (pi) filter. **8**

OR

10. a) Write short note on resistive transducer. **8**
- b) Explain the different modulation technique use in mines. **8**
