B.E.(with Credits)-Regular-Semester 2012-Mining Engineering Sem III

MN304 - Mine Electrical Engineering

P. Pages : 2 **GUG/W/16/3802**

Time : Three Hours * 3 6 3 7 * Max. Marks : 80

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

1. a) Compare the advantages and disadvantages of D. C and A. C systems for transmission and distribution. **8**

b) Distinguish between a feeder, a distributor and service mains. What is the criterion used for designing each of them. **8**

OR

2. a) Derive an expression for the regulation of a short transmission line in terms of line constants. **8**

b) An 11kV single phase transmission line has a resistance of 1.5Ω and reactance of 4Ω respectively. Calculate the percentage regulation and efficiency of the line with total load of 5000kVA at 0.8 lagging power factor is supplied at 11kV at the distant end. **8**

3. a) Why a consumer having low power factor is charged at high rates ? **8**

b) Discuss the various methods for power factor improvement ? **8**

OR

4. a) What is importance of power factor tariff ? **8**

b) The maximum demand of a consumer is 20A at 230V and his total energy consumption is 8760kWh. If the energy is charged at the rate of 20 paisa per unit for 500 hours use of the maximum demand per annum. plus 100 paisa per unit for additional units. Calculate annual bill and equivalent flat rate. **8**

5. a) Briefly discuss the factor which determine the choice of an electric motor for a drive. **8**

b) What is electrical braking ? Explain regenerative braking. **8**

OR

6. a) Explain the construction and working of an SCR. **8**

b) Briefly describe some practical application of FET. **8**

7. a) What is a circuit breaker ? Describe its operating principle. **6**

b) A100kvA distribution transformer has a maximum efficiency of 98% at full load and unity power factor. Determine its iron loss and full load copper losses. **10**
The transformer undergoes a daily load cycle as follows: -

Load	Power Factor	Load duration
100kVA	1.0	8 hr
50kVA	0.8	8 hr
No load	-	10 hr

Determine its all day efficiency.

OR

8. a) A 20 kvA, 2200/ 220V, 50 Hz distribution transformer is tested for efficiency and regulation as follows. **12**

O.C	test:-	220V,	4.2A,	148W	L.V side
S.C	test:-	86V,	10.5A,	360W	h.V side

Determine (i) core loss (ii) equivalent resistance referred to primary & secondary (iii) equivalent reactance referred to primary & secondary (iv) regulation of transformer at 0.8 p.f. lagging current (v) efficiency at full load and half load at 0.8. pf lagging current.

b) Why transformer rating is in kVA. **4**

9. a) Explain the general principles of radio broadcasting, transmission and reception. **8**

b) Explain the construction and working of a digital frequency counter. **8**

OR

10. a) If the collector current changes from 2mA to 3mA in a transistor when collector emitter voltage is increased from 2V to 10V. What is the output resistance ? **8**

b) Draw the input and output characteristics of CB connection. What do you infer from these characteristics ? **8**

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