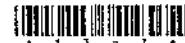


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PART – A

Marks : 40

Note : Attempt all the **twenty** questions. Each question carries **2** marks. Answer should not exceed **15** words.

1 What do you understand by solar insolation ?

2 Define diversity factor.

3 What do you understand by base load generating plant ?



4 What are the limitations of open cycle MHD system ?

5 Define making capacity of a circuit breaker.

6 What are the quantities which are defined a priori in load bus and voltage bus ?



7 What is synchronous condenser ?

8 Define Transient stability and give causes that disturb it.

9 What do you understand by under-reach of an impedance relay ?



10 What is hysteresis loss ?

11 Write the name of different types of circuit breakers.

12 Define fusing factor of a fuse.



13 Prove the condition under which a transformer attains the maximum efficiency.

14 Why, one of the buses is considered as a slack-bus in carrying out load flow studies?

15 Draw and explain torque-slip characteristic of an induction motor.

16 What do you understand by back to back DC-link ?

17 Draw the V-curves and power factor curves for a given synchronous motor.

18 What are the conditions under which two synchronous generators can operate in parallel ?



19 For a P-poles synchronous motor what is the total electrical degrees in one rotation ?

20 What is the need of an impulse test for high voltage apparatus ?



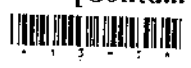
PART – B

Marks : 60

Note : Attempt all the **twelve** questions. Each question carries **5** marks. Answer should not exceed **50** words.

21 Give methods to measure power frequency high voltage.

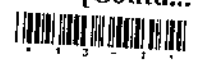
22 Why the secondary of a CT is not kept open circuited ?



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23 Why the Mho relay is preferred for the protection of long distance transmission lines ?

24 Derive the condition for maximum efficiency of a transformer.



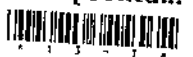
25 Fuel input for two thermal plants are expressed as :

$$F_1 = 0.2 P_1^2 + 40P_1 + 120 \text{ Rs./hr.}$$

$$F_2 = 0.25 P_2^2 + 30P_2 + 150 \text{ Rs./hr.}$$

Determine the most economic loading of the two plants for a load demand of 180 MW.

26 Discuss, why a duplicate bus bar system is preferred over a single bus bar system.



27 Draw the equivalent circuit diagram of a transformer and write its importance.

28 How will you calculate all day efficiency of a transformer, explain with some suitable example.



29 Give the concept of CORONA and explain its effects.

31

30 What is the technical difference between cylindrical rotor and salient pole synchronous machines ?

32

31 An 8-pole alternator runs at 900 rpm and supplies three phase power to a 6-pole induction motor which has a full load slip of 6%. What is the full load speed of an induction motor ?

32 How does high voltage support bulk power transmission ? Explain.



PART - C

Marks : 100

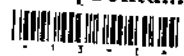
Note : Attempt any 5 questions. Each question carries 20 marks. Answer should not exceed 200 words.

33 What is fast breeder ? Briefly explain various components of typical nuclear power plant.



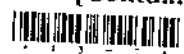
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34 Explain the equal incremental costs criteria for optimum scheduling in power plant having total K units committed.

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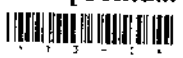
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35 What is current chopping as regards to circuit breaker ?

For a 50 Hz, 132 kV system, the reactance and capacitance upto the location of fault is 3 ohms and 0.015 microfarad respectively. Calculate the following :

- (a) The frequency of transient oscillations
- (b) The maximum value of restriking voltage
- (c) The maximum value of RRRV



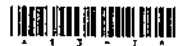
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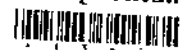


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36 A transmission line is to be protected using three zone mho relay having maximum torque angle as 60° . Determine the three zone setting of the relay from the following data : Impedance for the first section is $2.5 + j5.0$ ohms (primary) and that for second section is $3.5 + j7.0$ ohms (primary). The first zone covers 80% of the first section, the second zone covers first section plus 30% of the second section and the third zone covers first section plus 120% of the second section. Assume CT and PT ratios as 400/1 A and 132 kV/110 V respectively.



37 Compare critically the various methods used for starting three phase induction motors. Also explain, why does the rotor resistance method for regulation of speed proves to be uneconomical ?



38 Prove that a magnetic field of constant magnitude, rotating at synchronous speed, is developed when the stator of a 3-phase induction motor is fed with a 3-phase balanced power supply. Draw torque-slip curve of an induction motor and discuss the effect of rotor resistance on the torque-slip curve of induction motor.



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- 39 Draw a typical impulse voltage wave shape. Describe the working of a multistage impulse generator used for impulse testing of a transformer.

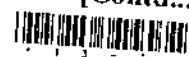


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