

Scheme – G

## Sample Question Paper

Course Name : Electrical Engineering

Course Code: EE/EP

Semester : Third

Subject Title : Electrical Power Generation

Marks : 100

# 17324

Time: 3 Hrs

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### Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

### Q.1 Attempt any TEN of the following.

20 Marks

- a) State any four renewable sources of energy.
- b) State any two disadvantages of thermal power plant.
- c) State any two types of condensers used in thermal power plants.
- d) List any two hydro power plants in Maharashtra State with their capacity.
- e) What is hydrology? State its importance.
- f) Define chain reaction?
- g) State any one material for Moderator and control rod used in nuclear reactor.
- h) State any two advantages of nuclear power station.
- i) State any four applications of diesel power plants.
- j) State any two merits of interconnections of power stations.
- k) State the meaning of terms- hot reserve and cold reserve.
- l) What is captive power plant?

### Q.2 Attempt any FOUR of the following.

16 Marks

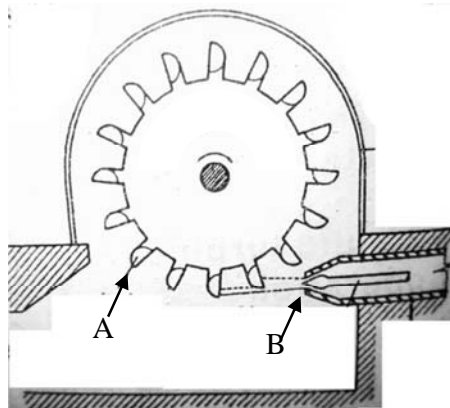
- a) Define calorific value. State the calorific value of lignite and Bituminous coal.
- b) Compare jet condenser with surface condenser on the basis of principle, initial cost, maintenance cost, and space required for condensation.
- c) Draw labeled schematic block diagram of thermal power plant showing all the systems.

- d) State the consequences of not proper working of super heater in steam generating power plant.
- e) State any four salient features of turbo alternator.
- f) Justify the statement, “Hydro power plants are used as a peak load power plants.”

**Q3. Attempt any FOUR of the following.**

**16 Marks**

- a) Study the following figure and answer the following questions.



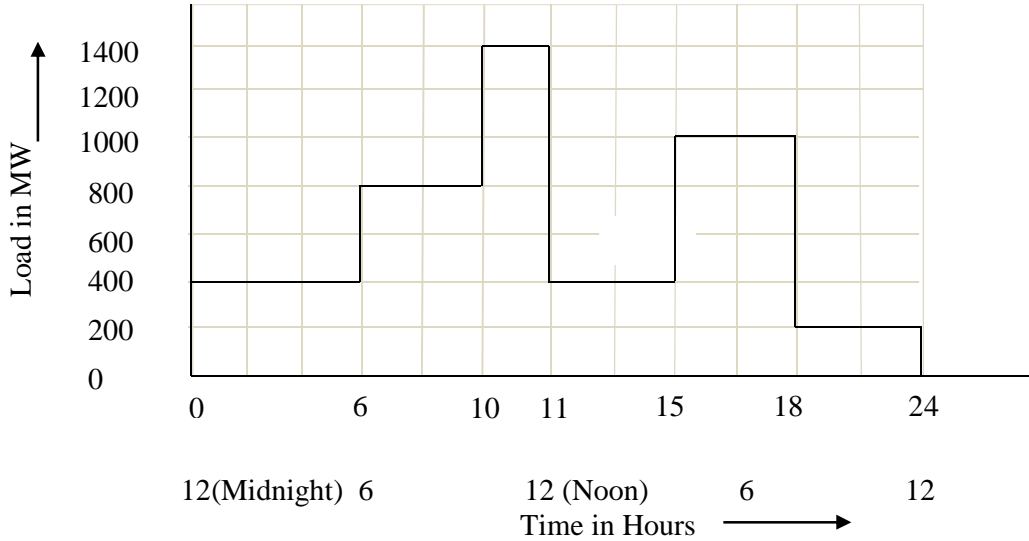
- i) Identify the type of turbine.
  - ii) Name the part 'A'
  - iii) State the function of part 'B'
  - iv) State the particular application of this turbine.
- b) Compare pressurised water reactor (PWR) and Fast Breeder reactor (FBR) on the basis of principle, construction, cooling and cost.
  - c) Describe four strokes of engine operation with the help of sketch.
  - d) Describe the construction of Jet condenser with the help of diagram.
  - e) What is pumped storage plant? What are its advantages?
  - f) List out advantages of disadvantages of Nuclear Power Station.

**Q.4 Attempt any FOUR of the following.**

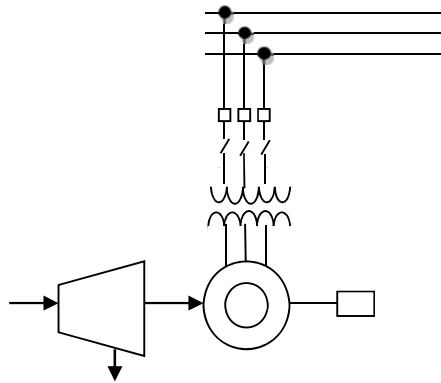
**16 Marks**

- a) State the factors governing the selection of site for hydro electric power plant.
- b) Classify the types of engines on the basis of strokes, fuel used, arrangement of cylinder and type of cooling.
- c) The daily load curve of a power station is shown in following figure. Study the figure and answer the following questions.

- i) What is the maximum demand on the power station?
- ii) Calculate units generated per day.
- iii) Find the average load.
- iv) What is the load factor?



- d) The unlabeled schematic diagram of electrical system in steam power plant is shown in figure. What are the mistakes in a given diagram (if any)? Redraw the correct schematic diagram showing the correct labeling.



- e) Draw the layout of medium size diesel electric power plant.
- f) What problems are faced by the environment if electrostatic precipitator in steam power plant is not working properly?

**Q5. Attempt any FOUR of the following.**

**16 Marks**

- a) What are the reasons for using cadmium as a control rod in nuclear reactor? Suggest other suitable materials for control rod.
- b) Draw the schematic diagram of solar thermal power plant.
- c) Describe the wind energy conversion system with the help of block diagram.
- d) Describe the construction of pressurised water nuclear reactor with the help of sketch.

- e) State the precautionary measures are adopted in hydro power plant for protection of penstock.
- f) Describe the various controls of nuclear reactor.

**Q6. Attempt any FOUR of the following.**

**16 Marks**

- a) Define the following terms related to solar radiation.
  - i) Diffuse radiation
  - ii) Beam radiation
  - iii) Insolation
  - iv) Solar constant
- b) State the importance of load duration curve. Give any four points.
- c) State any types of solar collectors with their particular application.
- d) What are the critical factors in disposal of nuclear waste?
- e) The generating station has a maximum demand of 20 MW, a load factor of 60%, a plant capacity factor of 48% and a plant use factor of 80%. Calculate-
  - i) The daily energy produced
  - ii) The reserve capacity of plant
  - iii) The maximum energy that could be produced daily if the plant was running all the time.
  - iv) The maximum energy that could be produced daily if the plant was running fully loaded and operating as per schedule.
- f) State any four advantages of wind energy system.