

Enrollment No.....



Faculty of Engineering
End Sem (Odd) Examination Dec-2017
EE3CO01 / EX3CO01 Generation of Electric Power
Programme: B.Tech. Branch/Specialisation: EE/EX

Duration: 3 Hrs.**Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

- Q.1 i. The air pre-heater is installed: **1**
 (a) Between economizer and chimney
 (b) Before super heater
 (c) Before fuel bed
 (d) None of these
- ii. When steam reaches the turbine blades, the type of force responsible for moving blades is: **1**
 (a) Axial force (b) Shear force
 (c) Longitudinal force (d) All of these
- iii. The suitable turbine for high head hydro power plant is: **1**
 (a) Kaplan turbine (b) Francis turbine
 (c) Pelton turbine (d) None of these
- iv. In a hydro plant, if the discharge is $200 \text{ m}^3/\text{s}$ and the head of the water is 100 m. If the efficiency of the turbine-alternator is set to 0.85, the electrical power developed is: **1**
 (a) 66.67 MW (b) 166.7 MW
 (c) 667.8 MW (d) 176.52 MW
- v. Nuclear plants are used as base load plants because **1**
 (a) They can be started quickly
 (b) Their output can be changed quickly
 (c) Their output cannot be changed quickly and they give optimum performance near full load.
 (d) All of these

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- vi. Moderator in a nuclear power plant is used to **1**
(a) Reduce temperature
(b) Extract heat from nuclear reaction
(c) Cause collision with fast moving neutrons to reduce their speed
(d) All of these
- vii. MPPT is very useful in solar plants because **1**
(a) It is easy
(b) It reduces maintenance
(c) It gives optimum performance over entire day
(d) None of these
- viii. Grid connected photo-voltaic plants are not recommended for locations where power failures are frequent because **1**
(a) They are not economic
(b) They require more maintenance
(c) They require grid supply for their operations
(d) All of these
- ix. Which type of generator is generally employed in wind power plants **1**
(a) Synchronous generator (b) Induction Generator
(c) DC Generator (d) None of these
- x. Which of these is not part of modern wind mill **1**
(a) Gear Box (b) Yaw drive (c) Compressor (d) All of these
- Q.2 Attempt any two :
i. Classify boilers. Compare different types of boilers for different applications. **5**
ii. Enlist different types of condensers. Discuss their relative advantages and disadvantages. **5**
iii. Discuss different factor while selecting the site for a coal based power plant. Explain general layout of a coal based power plant. **5**
- Q.3 Attempt any two:
i. Enlist and discuss different types of water turbines used in hydro power plants. **5**
ii. How the sites for hydro power plants are selected, give general guidelines and discuss. **5**

- iii. Write short Note on : **5**
(a) Hydrographs (b) Flow duration curves
- Q.4 Attempt any two:
i. Enlist and discuss the advantages and disadvantages of gas turbine based power plants. Why gas turbine based power plants are used to meet peak power demand. **5**
ii. Explain the working of a fusion type of nuclear power reactor with suitable diagram. **5**
iii. Write short notes on : **5**
(a) Binding energy (b) Mass defect
- Q.5 Attempt any two:
i. Draw I/V characteristics of a PV cell and explain its working. Explain the working of a PV based power plant. **5**
ii. Discuss general layout of a PV based solar power plant. Under what conditions autonomous and grid connected power plants are used, discuss with examples. **5**
iii. Write the effect of variation of solar insolation and temperature on solar PV plant with suitable characteristics. **5**
- Q.6 Attempt any two:
i. Discuss the working of an Induction generator for wind energy applications. Explain the reactive power requirements of an induction generator with suitable diagram. **5**
ii. Explain with suitable diagram the working of a doubly fed induction generator. **5**
iii. Explain the working of horizontal axis wind turbine with suitable diagram. Also write the advantages and disadvantages. **5**

Marking Scheme

Q.1	i. (a)	1	iii. Write short notes on : (2.5 marks each)	5
	ii. (a)	1	(a) Binding energy (b) Mass defect	
	iii. (c)	1		
	iv. (b)	1		
	v. (c)	1		
	vi. (d)	1		
	vii. (c)	1		
	viii. (d)	1		
	ix. (b)	1		
	x. (c)	1		
Q.2	Attempt any two :		Q.5	Attempt any two:
i.	Classify boilers. Compare different types of boilers for different applications. (2 marks , 3 marks)	5	i.	Draw I/V characteristics of a PV cell and explain its working. Explain the working of a PV based power plant. (1 mark, 2 marks , 2 marks)
ii.	Enlist different types of condensers. Discuss their relative advantages and disadvantages. (2 marks , 3 marks)	5	ii.	Discuss general layout of a PV based solar power plant. Under what conditions autonomous and grid connected power plants are used, discuss with examples. (3 marks , 2 marks)
iii.	Discuss different factor while selecting the site for a coal based power plant. Explain general layout of a coal based power plant. (2 marks , 3 marks)	5	iii.	Write the effect of variation of solar insolation and temperature on solar PV plant with suitable characteristics. (2.5 marks, 2.5 marks)
Q.3	Attempt any two:		Q.6	Attempt any two:
i.	Enlist and discuss different types of water turbines used in hydro power plants. (5 types, 1 mark each)	5	i.	Discuss the working of an Induction generator for wind energy applications. Explain the reactive power requirements of an induction generator with suitable diagram. (2.5 marks, 2.5 marks)
ii.	How the sites for hydro power plants are selected, give general guidelines and discuss. (2 marks , 2 marks, 1 mark)	5	ii.	Explain with suitable diagram the working of a doubly fed induction generator. (2 marks , 3 marks)
iii.	Write short Note on : (2.5 marks each)	5	iii.	Explain the working of horizontal axis wind turbine with suitable diagram. Also write the advantages and disadvantages. (3 marks , 2 marks)
	(a) Hydrographs (b) Flow duration curves			
Q.4	Attempt any two:			
i.	Enlist and discuss the advantages and disadvantages of gas turbine based power plants. Why gas turbine based power plants are used to meet peak power demand. (3 marks , 2 marks)	5		
ii.	Explain the working of a fusion type of nuclear power reactor with suitable diagram. (3 marks , 2 marks)	5		
