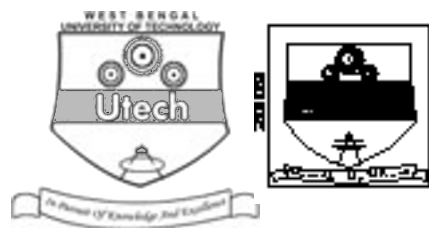


POWER PLANT INSTRUMENTATION (SEMESTER - 8)

CS/B.TECH (EIE-NEW)/SEM-8/EI-801A/09



1.
Signature of Invigilator

2.
Signature of the Officer-in-Charge

Reg. No.

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Roll No. of the
Candidate

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CS/B.TECH (EIE-NEW)/SEM-8/EI-801A/09
ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL – 2009
POWER PLANT INSTRUMENTATION (SEMESTER - 8)

Time : 3 Hours]

[Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
b) For **Groups – B & C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

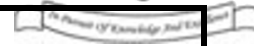
FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

	Group – A										Group – B					Group – C					Total Marks	Examiner's Signature
Question Number																						
Marks Obtained																						

.....
Head-Examiner/Co-Ordinator/Scrutineer

8852-A/D (25/04)



DO NOT WRITE ON THIS PAGE



ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL - 2009

POWER PLANT INSTRUMENTATION

SEMESTER - 8



Time : 3 Hours]

[Full Marks : 70

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

i) The modern steam turbines are

- | | |
|------------------------------|---------------------|
| a) Impulse turbine | b) reaction turbine |
| c) impulse-reaction turbines | d) none of these. |

ii) For forced draught systems, the function of chimney is mainly

- | |
|---|
| a) to produce draught to accelerate the combustion of fuel |
| b) to discharge gases high up in the atmosphere to avoid hazard |
| c) to reduce the temperature of the hot gases discharged |
| d) none of these. |

iii) ESP is used to control

- | | |
|---------------------------|---|
| a) CO in air | b) SPM in air |
| c) CO ₂ in air | d) SO _x / NO _x in air |
| e) none of these. | |

iv) Air velocity in ducts is measured by

- | | |
|-------------------|----------------|
| a) Venturimeter | b) Pitot tube |
| c) Orifice plate | d) Straboscope |
| e) none of these. | |



v) The amount of excess air for combustion of coal is around

- | | |
|-------------------|--------|
| a) 5% | b) 10% |
| c) 15% | d) 20% |
| e) none of these. | |



vi) Removal of dissolved gases from boiler feed water is called

- | | |
|-------------------|-------------------|
| a) Degasification | b) Deaeration |
| c) Deoxidation | d) none of these. |

vii) What is the advantage of a modulating burner control ?

- | |
|---|
| a) Inexpensive |
| b) Simple |
| c) Able to tolerate large and fluctuating loads |
| d) all of these. |

viii) Which power plant is economical ?

- | |
|-------------------|
| a) Thermal |
| b) Nuclear |
| c) hydroelectric. |

ix) Super heater is used in boiler for

- | | |
|------------------|---------------------|
| a) water heating | b) dryness of steam |
| c) economising | d) none of these. |

x) For suction of flue gas we use

- | | |
|------------------|------------------|
| a) ID fan | b) FD fan |
| c) none of these | d) all of these. |

xi) Throughout the steam circuit pH to be maintained

- | | |
|---------------------|--------------------|
| a) below 7 | b) between 7 and 8 |
| c) between 8 and 10 | d) above 12. |



5

GROUP – B**(Short Answer Type Questions)**Answer any *three* of the following.

3 × 5 = 15

2. What is Excess air ? How does it affect the combustion in coal based thermal power plant ? 1 + 4
3. Write the functions of the Economiser and Air preheater.
4. Describe heat engines based on Carnot cycle. Name at least three other machines which utilises the mechanism of energy conversion. 3 + 2
5. Explain in brief the applications of LVDT in measurement of pressure. 5
6. What is the role of conductivity measurement in thermal power plant ? How is the conductivity of superheated steam measured ? 2 + 3

GROUP – C**(Long Answer Type Questions)**Answer any *three* of the following questions.

3 × 15 = 45

7. What is Balance draft ? How the draft of the furnace is measured ? Draw a loop for control of the furnace draft and explain its operation. 2 + 3 + 10
8. Mention different pollutant emissions from fossil fuel based power plant. Describe the control technique for reducing NO_x and SO_x emission. Describe one on line method to measure CO and CO₂ emission. 2 + 8 + 5
9. Draw the block diagram of a generalised Data Acquisition System and explain the function of different parts. 5 + 10
10. Explain the different components of nuclear power plant and safety instrumentation.

8 + 7

11. Write short notes on any *three* of the following :

- i) Shrink-Swell phenomenon
- ii) Flue gas analyser
- iii) Water treatment
- iv) Sodium analyser
- v) Hydropower station.



3 × 5

END