346

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7E1832

Roll No. _____ [Total No. of Pages : 2

7E1832

B.Tech. VII-Sem. (Main) Examination, December - 2023
Electrical Engg.
7EE5-11 Wind and Solar Energy Systems

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

PART - A

(Answer should be given up to 25 words only).

All questions are compulsory. **(10×2=20)**

1. What are the application of Anemometers and Wind Vane in wind farm?
2. Give an idea about the voltage and frequency operating limits.
3. What do you mean by Standard Time Zones?
4. Write down the applications of solar energy in general life.
5. What is the application of MPPT in solar system?
6. What are the causes and consequences of voltage sag?
7. Explain the term 'Stall'.
8. What is the reason for deploying Induction Generator in Wind turbine.
9. What do you mean by power converter?
10. What do you know about solar day?

347

PART-B

Analytical/Problem Solving questions.

Attempt any Five questions. **(5×4=20)**

1. Explain V-I characteristics of PV cell in brief?
2. What is grid code? Explain its technical requirement.
3. Explain the estimation of Solar Energy availability.
4. What do you know about the Pitch control of wind turbine?
5. What do you mean by Probability Distribution Functions for Wind?
6. What is solar geometry? Explain in brief.
7. Explain the parabolic trough and central receiver in brief.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions) **(3 × 10= 30)**

Attempt Any Three Questions.

1. Write the short notes on following:
   a) Generator-Converter configurations for wind generation.
   b) Fresnel.
   c) Solar radiation spectra.
2. Explain amorphous, monocrystalline and polycrystalline solar technologies in details.
3. Explain solar PV and wind farm behavior during various grid disturbances in details.
4. Write the short notes on following:
   a) Indian and global statics of solar and wind power.
   b) PV cell, PV module and PV array.
   c) Solar pond.
5. Explain power quality issues in details.

348

133409

7E1732

Roll No. _____ [Total No. of Pages : 2

7E1732

B.Tech. VII-Sem. (Back) Examination, December - 2023
Electrical Engineering
7EE5-11 Wind and Solar Energy Systems

Time : 3 Hours **Maximum Marks : 120**
Min. Passing Marks : 42

Instructions to Candidates:

Attempt All Ten questions from Part A, Five questions out of Seven from Part B and Four questions out of Five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

Answer should be given up to 25 words only.

All questions are Compulsory. **(10×2=20)**

1. What is qip speed ratio?
2. How is Wind speed calculated?
3. Can a wind turbine of 100% efficiency be built explain the answer?
4. Give two differences between Fixed and Variable speed Wind turbine.
5. Explain V-I characteristics of PV cell?
6. What is Solar angle?
7. What is a Solar PV array?
8. Explain Grid code?
9. What is a Wind farm?
10. Give application of Solar Pond?

PART-B

(Analytical/Problem Solving questions).

Attempt any Five questions. **(5×8=40)**

1. Explain Scope and outcome of the course?
2. Explain the concept of Power cumulative distribution function also give its application.
3. With reference to wind generator topologies explain: Generator-converter configurations.
4. a) The height of the building is 2 meters and its shadow is 3 meters. give its Sun angles?

   b) Explain how solar energy availability is estimated?
5. Explain the following

   i) Monocrystalline

   ii) Polycrystalline
6. Explain the term "Power Quality" and do explain issues related to this in PV-WT connected grid?
7. By help of neat diagram explain a parabolic dish.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions). **(4×15=60)**

Attempt Any Four Questions.

1. Is it possible for a wind turbine to consume all wind speed, explain its reason? also derive expression of betz limit?
2. Design O Doubly fed Induction generator base wind turbine? Also give its application, Characteristics and challenges?
3. By help of suitable design explain power electronic converters for a solar system with its characteristics.
4. Give a model for hybrid and isolated operation of Solar PV and Wind system?
5. Explain the working model of Fixed and variable speed wind turbine?

350

7E1810

Total No. of Questions:

Total No. of Pages: 02

Roll No. _____

B.Tech. VII-Sem (Main) Exam 2023
Open Elective-I
7AG6-60.1Human Engineering and Safety
7E1810

Time: 3 Hours

Maximum Marks: 70

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly. Use of following supporting material is permitted during examination. (Mentioned in form No.205)

1. Nil

2. Nil

Part A (Answer should be given up to 25 words only)
All questions are compulsory

Q.1 What do you understand by human engineering?

Q.2 Write about importance of safety for human.

Q.3What do you understand by the term 'Ergonomics'

Q.4 Write about human performance.

Q.5Whatdo you understand by measurement of energy?

Q.6What do you mean by energy cost?

Q.7 Give difference between workplace and workspace.

Q.8What do you understand by the term heat exchange?

Q.9Write a note on offences and their trial.

Q.10What are the safety equipment for farmers?

10 x 2 = 20

Part B (Analytical/Problem solving questions)
Attempt any Five questions

Q.1Discuss about relative advantages of man and machine.

Q.2 Explain about basic process in system development.

Q.3 Write about direct and indirect method of measurement of energy.

Q.4.How do you calculate energy cost of activities? Also discuss about acceptable work load.

Q.5 Write a note on atmosphere condition, also discuss about effects of climate performance.

Q.6 Discuss about important provisions of dangerous machine (regulation) act.

Q.7Whatare the duties and responsibilities of manufacturers of dangerous machines?

5x 4 = 20

Part C (Descriptive/Analytical/Problem Solving/Design question)
Attempt any three questions

Q.1 Discuss about objectives of ergonomics and explain factors considered in system development.

Q.2Whatdo you understand by human technology interaction? Also write about commonly used types of visual displays.

Q.3 Whatare the causes of noise and vibration? Discuss about measurement and control of noise and vibrations.

Q.4Whatis the difference between evaporation, convection and conduction? Discuss about physiological responses & heat exchange and effects of heat on performance.

Q.5 a) Discuss about rehabilitation scheme for agricultural accident victims.

b) Write about safety gadgets for farm machines/ activities.

3 x 10= 30

352

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7E1811

Roll No. _____ [Total No. of Pages : 2

7E1811

B.Tech. VII-Sem. (Main) Examination, December - 2023
Open Elective-I
7AG6-60.2 Environmental Engineering and Disaster Management

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of Seven questions from Part B and three questions out of five questions from Part C
Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.
Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer Should be given up to 25 words only)

All questions are compulsory **(10×2=20)**

1. Discuss the scope of Environmental Engineering and Disaster Management Course?
2. Describe the various sources of Water supply.
3. Write the drinking water quality parameters.
4. Discuss the necessity of treatment of water.
5. Describe the design principles of setting tank.
6. Explain sedimentation with coagulation?
7. Describe the term "Flocculation".
8. Discuss the characteristics of domestic waste water.
9. What are the types of air pollutants?
10. Describe the term "Disaster".

PART-B

(Analytical/Problem solving questions).

Attempt any Five questions. **(5×4=20)**

1. Discuss the importance of safe water supply system also define safe water.
2. Differentiate water requirements for urban and rural areas?
3. Discuss the transportation of water from treatment plant to domestic uses.
4. Explain the disposal of domestic waste water in urban and rural area?
5. Discuss the various types of sewers? with neat sketches.
6. Define Air Pollution? Discuss the effects of air pollutants on living beings?
7. Discuss the various types of Disaster and their harmful effects.

PART - C

(Descriptive/Analytical/Problem Solving/Design question).

Attempt any Three questions. **(3×10=30)**

1. What is sanitation? Discuss the Importance of sanitation. How it is followed in Urban and rural areas
2. Design a sewer to serve the population of 36000. Daily water supply per capita = 135 *l* of which 80% goes into the sewer. Slope, $S=\frac{1}{625}$ and the sewer would be designed to carry 4 times the average discharge under design condition. What would be the velocity generated if n = 0.012 and it is assumed to be constant.
3. Determine the size of a circular sewer for a discharge of 500 litres per second running half full. Assume S= 0.0001 and n = 0.015.
4. Explain the domestic Waste water treatment methods. Discuss the design parameters of trickling filter.
5. Write the BIS standards for pollutants in air, and also discuss their abetments. How the air pollution can be controlled, throw the light on major causes?

354

132238

7E1813

Roll No. _____ [Total No. of Pages : 2

7E1813

B.Tech. VII-Sem. (Main) Examination, December - 2023
Open Elective - I
7CE6-60.1 Environmental Impact Analysis

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of Seven questions from Part B and three questions out of five questions from Part C.
Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.
Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer Should be given upto 25 words only)

All questions are compulsory.

(10×2=20)

1. Define Environmental Impact Statements (EIS).
2. What is the preliminary assessment in EIA?
3. What are the primary objectives of MoEF and CPCB?
4. Describe land pollution.
5. Differentiate air quality and air quality index.
6. What are noise barriers?
7. Mention the industrial policy of GoI on EIA.
8. What is flora and fauna?
9. Mention different classes of water.
10. What do you understand by energy impact?

PART-B

(Analytical/Problem solving questions)

Attempt any Five questions. **(5×4=20)**

1. Explain the concept of ecosystem imbalance.
2. Summarize the guidelines of MoEF and CPCB on EIA.
3. How do construction activities cause land pollution?
4. Write short notes on the following:
   a) Rio Earth Summit and
   b) Copenhagen Conference.
5. What are the impacts of development projects on water quality?
6. Describe the environmental issues associated with Nuclear Power Plants.
7. Explain the role of public participation in environmental decision making.

PART - C

(Descriptive/Analytical/Problem Solving/Design question)

Attempt any Three questions. **(3×10=30)**

1. Describe the different methodologies for Environmental Impact Assessment.
2. Write about air quality standard. Explain the impact on air quality due to the industry transport system.
3. Define Biota. How can human activity create an impact on flora and fauna? Suggest a few mitigation measures and alternatives.
4. Explain the noise scales and rating methods. How do we estimate the impacts of transportation noise?
5. Describe any one case study of EIA in detail.

356

7E1836

Total No. of Questions:

Total No. of Pages:1

Roll No. _____

B.Tech. VII-Sem (Main)Exam Dec. 2023
Open Elective-I
7EE6-60.2Power Generation Sources
7E1836

Time: 3 Hours

Maximum Marks: 70

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

1. _____ 2. _____

Part A (Answer should be given up to 25 words only)
All questions are compulsory

Q. 1 What is sustainable development?
Q.2 Explain nuclear fission.
Q.3 What are solar collectors? Name any two solar collectors.
Q.4 What are the factors being considered while selecting a site for wind power plant?
Q.5 Define pyrolysis.
Q.6 Define Tidal Energy.
Q.7 Where is fast breeder deployed?
Q.8 Explain magnus effect.
Q.9 Explain use of air preheater in thermal power plant.
Q.10 Give any four applications of solar pv system

10 x 2 = 20

Part B(Analytical/Problem solving questions)
Attempt any Five questions

Q.1 Explain the world energy status with reference to energy scenario in India.
Q.2 Explain the working of solar pond with the help of neat schematic diagram.
Q.3 Explain the thermal power plant with the help of neat schematic diagram.
Q.4 Explain open and closed OTEC with the help neat diagram.
Q.5 Define Fuel cell. Differentiate between fuel cell and battery. Explain principle of operation of fuel cell technology.
Q.6 List various process of energy conversion from biomass. Explain any one process.
Q.7 Differentiate between nuclear and thermal power plant.

5x 4 = 20

Part C(Descriptive/Analytical/Problem Solving/Design question)
Attempt any three questions

Q. 1 What is Geothermal Energy? Explain the origin of geothermal energy resource. Explain liquid dominated geothermal power plant with necessary sketch.
Q.2 Compare conventional thermal power plant and solar thermal power plant.

Q.3 List various types of wind energy conversion system (WECS). Explain hybrid wind energy conversion system (WECS) with applications.

Q.4 Draw a neat schematic diagram of simple gas turbine power plant. State various applications of Gas turbine power plant.

Q.5 Explain the following: -
(i) Solar Dryer (ii) Solar Pump (iii) Concentrating type solar collector

3 x 10= 30

7E1710

Roll No. _____ [Total No. of Pages : 2

7E1710

B.Tech. VII-Sem. (Back) Examination, December - 2023
Open Elective - I
7AG6-60.1 Human Engineering and Safety

Time : 3 Hours **Maximum Marks : 120**
Min. Passing Marks : 42

Instructions to Candidates:

*Attempt **All Ten** questions from **Part A, Five** questions out of **Seven** from **Part B** and **Four** questions out of **Five** from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are Compulsory. **(10×2=20)**

1. Write the outcome of this course.
2. Describe the concept of systems.
3. Discuss the term "human performance".
4. Define auditory displays.
5. Describe the energy measurement.
6. Explain the term "noise".
7. What do you understand by Anthropometry.
8. How Vibration can be controlled.
9. Differentiate noise and vibration.
10. Define dangerous machine act.

359

PART-B

(Analytical/Problem Solving questions)

Attempt any Five questions. **(5×8=40)**

1. Discuss the basic processes of system development?
2. Differentiate the visual, auditory and factual displays?
3. Describe the direct and indirect methods of energy measurement?
4. How the noise can be measured and discuss the factors to control the noise?
5. Describe the heat exchange process in Anthropometry?
6. Explain the dangerous machine act and its importance?
7. Explain the process of rehabilitation and compensation to accident victims.

PART - C

(Descriptive/Analytical/Problem Solving/Desing questions)

Attempt any Four questions. **(4×15=60)**

1. Describe the safety gadgets for spraying and threshing?
2. Explain the Chaff cutting and tractor and trailer operation?
3. Define the following:
   i) Energy cost of different activities
   ii) Acceptable work load
   iii) Performance reliability
4. Explain the arrangement and utilization of work space in Anthropometry?
5. Explain the information input process in system development?

360

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7E1711

Roll No. _____ [Total No. of Pages : 2

7E1711

B.Tech. VII-Sem. (Back) Examination, December - 2023

Open Elective - I

7AG6-60.2 Environmental Engineering and Disaster Management

Time : 3 Hours **Maximum Marks : 120**

Min. Passing Marks : 42

Instructions to Candidates:

Attempt all **Ten** questions from Part A, **Five** question out of **Seven** from Part B and **Four** questions out **Five** from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only) **(10×2=20)**

All questions are compulsory.

1. What is pollution define it
2. What do you mean by hazard and disaster.
3. What is garbage.
4. What is solid waste.
5. What is disaster management.
6. What is photochemical smog?
7. What do you mean by man-made disaster?
8. List the sources of thermal pollution.
9. What are the different properties of drinking water.
10. What is turbidity.

PART-B

(Analytical/Problem Solving questions)

Attempt any Five questions. **(5×8=40)**

1. Write a brief note on transportion of water.
2. Discuss the factor affecting quantity and composition of solid waste.
3. Discuss the demand of water for various purpose.
4. Write a note on bacteriological tests of drinking water quality.
5. Discuss and describe importance of sanitation.
6. What are the different types of domestic waste water explain it.
7. Discuss the importance of disaster management ?

PART - C

(Descriptive/Analytical/Problem Solving/ Design questions) **(4×15=60)**

Attempt Any Four Questions.

1. What is BIS standards. Explain BIS standard for pollutants in air and their abetments.
2. Describe primary and secondary pollutants and their properties in detail.
3. What are the common impurities months found in natural water? Explain their effect on the quality of water.
4. Discuss the scope and out come of Environmental engineering and disaster management.
5. Write short note on effects of land slide.

362

7E1713

Roll No. _____ [Total No. of Pages : 2

7E1713

B.Tech. VII-Sem. (Back) Examination, December - 2023
Open Elective-I
7CE6-60.1 Environmental Impact Analysis

Time : 3 Hours **Maximum Marks : 120**
Min. Passing Marks : 42

Instructions to Candidates:

Attempt All Ten questions from Part A, Five questions out of Seven from Part B and Four questions out of Five from Part C. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

ALL questions are Compulsory. **(10×2=20)**

1. Define is E.I.A?
2. What are E.I.S and E.M.P?
3. What is Stockholm convention?
4. What is the importance of Rio-Earth Summit?
5. What are the permissible limits of parameters like TDS, Fluoride, Nitrate and turbidity for potable water in India?
6. Define Air Quality Index.
7. What are important noise indices?
8. What is meant by flora and fauna?
9. Mention air quality standards for PM_{10} and SO_2 as per NAAQS in India
10. What is meant by Screening and Scoping?

PART-B

(Analytical/Problem Solving questions)

Attempt any FIVE questions. **(5×8=40)**

1. Describe the impact of human activities on environment.
2. Mention the industrial policy of the Govt.of India and its provisions.
3. What are the benefits and principles of EIA?
4. Discuss the immediate and long-term objectives of EIA.
5. Explain the steps involved in the EIA process and draw the flowchart of these steps.
6. How do the prediction and assessment of impacts on air, Water and noise are carried out? Explain with suitable examples.
7. What are the effects of noise on people? How can these be prevented and controlled.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any FOUR questions. **(4×15=60)**

1. What are the methodologies for conducting EIAs? Describe any one method in detail with its merits and demerits.
2. What are the water quality standards as per IS standards for drinking water? Mention the impacts on Water quality due to development projects.
3. How does the air quality get affected due to infrastructural projects? Discuss the air quality criteria and different air indices.
4. Explain the effect of developmental projects on cultural and social settings and economic profit of the community with some suitable examples.
5. Describe the case study of EIa of hydropower project considering all important steps involved.

364

7E1736

Roll No. _____ [Total No. of Pages : 2

7E1736

B.Tech. VII-Sem. (Back) Examination, December - 2023
Open Elective-I
7EE6-60.2 Power Generation Sources

Time : 3 Hours

Maximum Marks : 120
Min. Passing Marks : 42

Instructions to Candidates:

Attempt All Ten questions from Part A, Five questions out of Seven from Part B and Four questions out of Five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

Answer should be given up to 25 words only.

All questions are Compulsory. **(10×2=20)**

1. What are advantages and limitations of renewable energy sources?(2)
2. Differentiate between conventional and non-conventional energy sources.
3. Explain energy farming.
4. Explain Blade element theory.
5. Describe the principle of solar photovoltaic energy conversion.
6. Explain Fuel cell technology.
7. Give Applications of boiler in thermal plant.
8. What do you mean by hybrid system? Give examples.
9. Explain and state Betz law in context with wind energy.
10. Classify Tydal Power plant.

PART-B

(Analytical/Problem Solving questions).

Attempt any Five questions. **(5×8=40)**

1. Explain the future of renewable energy sources in Indian scenario. Which two sources arc most Prominent in Indian Condition?
2. Explain thermal power plant with neat diagram and also explain super heater and economiger.
3. Derive mathematical expression for magnus affect and also explain the effect in wind generation.
4. Differentiate between nuclear fission and nuclear fusion.
5. Explain thermal gassification of biomass. draw a labelled diagram of gassifier.
6. Explain working of tidal power plants.
7. Explain the working of open cycle Gas Turbine power plant. Also give its advantages.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions) **(4×15=60)**

Attempt Any Four Questions.

1. With a neat diagram explain working of Thermal power plant in detail.
2. Explain the following

   a) A sample of Uranium has 1.7×10^{24} atoms of U^{235}. If half life of U^{235} is 7.1×10^{8} years, find decay constant, initial activity and number of U^{235} atoms remaining after 10×10^{8} years

   b) A steam power station of 100MW capacity uses wal of calorific value 6400 cal/kg. The thermal efficiency of station is 30% and electrical generation efficiency is 92% , Find the coal require per hour when plant is working at full load.

3. Explain hydropower plant with neat diagram and also explain pain stock, reservoir.
4. Draw the block diagram of Gas power plant? Also explain working and compressor, combustion chamber and regeneration in detail.
5. With a neat diagram explain the working of solar pond based electric power plant with cooling tower.
