BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Electrical Skills (RET)

Session: 2021-22 (Winter Semester)

B. Voc. Program, V Semester

2nd In-Sem. Examination

Course Code: RET 1502 **Time: 1 Hour**

Course Name: Grid Integration and Distributed Generation of Renewable Energy

Max. Marks: 20

Instruction: 1. Answer all questions from each and every section.
2. Scientific calculator is allowed.

Section – A

05X01 = 05 Marks

1. Solar PV systems can be:
   a) connected to the power grid
   b) used to sell power to the grid
   c) a stand-alone source of electricity
   d) all answers a, b, c

2. The value of solar constant is approximately:
   (a) 6.5 kw/m^2 (b) 1367 w/m^2 (c) 3.64 kw/m^2 (d) 1 kw/m^{2+}

3. The position of Sun when it is located directly overhead is called:
   (a) Sun at Beneath (b) Sun at inclination (c) Sun at zenith (d) Sun at top

4. About 30% of all incoming solar radiation is reflected back into space. This is known as:
   (a) Irradiance (b) Reflectivity (c) Albedo effect (d) Diffuse radiation

5. How many PV cells are connected in series if 120 V are needed and one cell delivers 0.5 V?
   (a) 240 (b) 120 (c) 360 (d) 60

Section – B

03X02 = 06 Marks

1. How grid connected solar photovoltaic (PV) system can be categories?
2. Write short note on grid connected solar PV system for small power application?
3. A solar PV meter reads 10KWh and load meter reads 8KWh, what will be net energy meter reading?

Section – C

03X03 = 09 Marks

1. Explain the concept of solar mini grid system.
2. What is an array combiner box?
3. A solar PV module is rated for Voc=40V, Vmp=32V, Isc=8.5A and Imp=8A. Design a solar PV string to produce DC voltage output of 384V. What will be DC current output of the string?

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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Electrical Skills (RET)

Session: 2021-2022 (Winter Semester)

B. Voc. Program, V Semester,

2nd In- Sem. Examination

Course Code: RET 1501 **Time: 1 Hours**

Course Name: Smart and Micro Grid **Max. Marks: 20**

Instruction: Answer all the questions.

Section – A

05X01 = 05 Marks

1. Where is India's first Smart Grid Project was setup
   (a) Banglore (b) Pondicherry (c) Varodra (d) Bhopal

2. CDM Stands for:
   (a) Clean Development Mechanism (b) Clean Development Management
   (c) Clear Development Management (d) None of the above

3. Which among the following is a Green House Gas?
   (a)Carbon Dioxide (b)Carbon Monooxide
   (c) Nitrous oxide (d) All of these

4. In which article of Kyoto Protocol CDM is defined in
   (a) Article 11 (b) Article 12 (c) Article 13 (d) Article 14

5. "Smart Grid can be said Green Grid too" True or False
   (a) True (b) False

Section – B

03X02= 6 Marks

1. Write a short note on "' Electric Transportation".
2. What are the key objectives of CDM?
3. What do you understand by Low Carbon Energy and what are the low carbon sources of energy generation?

Section – C

03X03 = 9 Marks

1. What are the attributes of a Smart Grid?
2. What are the guidelines and policies of Government of India for deployment of Electric Vehicle Charging Station in India?
3. What are the Smart grid initiative for power distribution utility in India?

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Registration No.: .....

School of Electrical Skills (RET)

Session: 2021-22 (Winter Semester)

B. Voc. Program, 5th Semester,

2nd In-Sem. Examination

Course Code: RET1503 **Time: 1 Hour**

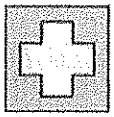
Max. Marks: 20

Course Name: Operation and Maintenance and Safety of Renewable Energy Plants

Instruction: 1. Answer all question from each and every section.
2. Scientific calculator is allowed.

Section – A

05X01 = 05 Marks

1. A type of electrical battery which can be charged, discharged into a load, and then recharged many times is called.....
   (a) Rechargeable battery (b) Secondary battery
   (c) Primary battery (d) Both a and b
2. What is the Full form of PLC?
   (a) Programmable logic controller (b)Program logic control
   (b) Programmable logical controller (d)Programmable logic controllable
3. Which one of the following is not a SCADA Manufacture?
   (a) Siemens (b) Honeywell
   (c) Microsoft (d) ABB
4. Which of these symbol is used for electrical danger?
   (a)  (b)  (c)  (d) 
5. Earth resistance in a typical domestic wiring is:
   (a) Less than 5 Ohms (b) Less than 8 Ohms
   (c) Around 100 Ohms (d) Very large

Section – B

03X02 = 06 Marks

1. Write down the components name of Solar lantern.
2. What is the use of Automation in solar on-grid power plants?
3. What is warning labels? and draw the any two electrical warning labels

Section – C

03X03 = 09 Marks

1. What is the advantage of electrical earthing and draw the layout diagram of electrical earthing in on-grid solar power plants?
2. Write down the start-up and Shut-down procedure of off-grid solar power plants?
3. Draw the diagram of organization structure of maintenance department.

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Registration No.:.....

School of Electrical Skills (RET)

Session: 2021-22 (Winter Semester)

B. Voc. Program, Vth Semester,

2nd In-Sem. Examination

Course Code: RET 1504 **Time: 1 Hour**

Course Name: Economics of Renewable Energy Systems **Max. Marks: 20**

Instruction: Answer all questions from section A, each question carries one mark. Answer all questions from section B, each question carries two marks. Answer all questions from section C, each question carries three marks. Scientific calculator is allowed.

Section – A

05X01 = 05 Marks

1. Depreciation is generated due to
   a) Increase in the value of liability
   b) Decrease in capital
   c) Wear and tear
   d) Decrease in the value of assets
2. According to straight line method of providing depreciation, the depreciation
   a) Remains constant
   b) Increase each year.
   c) Decrease each year
   d) None of them.
3. Salvage value means
   a) Definite sale price of the asset
   b) Cash to be received when life of the asset ends
   c) Cash to be paid when asset is disposed off
   d) Estimated disposal value
4. Multiplying your estimated daily load by a "fudge factor" of .....
   a) 1.0 b)1.5 c) 2.0 d) 2.5
5. It is recommended to use a factor of ..... to cover balance of system costs.
   a) 25% b) 20% c) 15% d) 30%

Section – B

03X02 = 06 Marks

1. What is depreciation reserve? Why is it necessary to maintain it?
2. Explain the procedure for SAPV system maintenance?
3. The equipment in a power station costs Rs 15,60,000 and has a salvage value of Rs 60,000 at the end of 25 years. Determine the depreciated value of the equipment at the end of 20 years by Diminishing value method.

Section – C

03X03 = 09 Marks

1. A distribution transformer costs Rs 2,00,000 and has a useful life of 20 years. If the salvage value is Rs 10,000 and rate of annual compound interest is 8%, calculate the amount to be saved annually for replacement of the transformer after the end of 20 years by sinking fund method.
2. Give the worksheet for sizing and estimating the cost of SAPV system.
3. Assuming that the useful life of 30 years for PV array system, number of sunshine hours is 5, interest rate (in % for renewable energy system in India) is 4%, voltage rating for battery is 12 V and battery backup will be able to provide power continuously for five days without recharging, PV modules can be purchased at retail for $5 per watt, Battery can be purchased at retail for $1 per amp hour, Inverter can be purchased at retail shop for $1 per rated W. Determine the present maintenance cost of SAPV for home load of 3650 Wh/day.