## **GUJARAT TECHNOLOGICAL UNIVERSITY** BE - SEMESTER-IV EXAMINATION – SUMMER 2016

## Subject Code:140902 Date:03/06/2016 **Subject Name: Electrical Power** Time:10:30 AM to 01:00 PM **Total Marks: 70 Instructions:** 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. Q.1 (a) With a neat schematic diagram explain steam power station. Also state it's 07 advantages and dis-advantages. State and explain Kelvin's law in detail. Also give it's practical limitations. 07 **(b)** Compare underground cables and overhead lines. Q.2 **(a)** 07 State different methods of laying cables. Explain any one in detail with it's **(b)** 07 advantages and dis-advantages OR (b) Discuss advantages and disadvantages of nuclear power station. 07 Derive the equation for inductance of three phase transmission line with **Q.3** (a) 07 unsymmetrical spacing. Assume transposition. (b) Discuss the various conductor materials used for overhead lines. What are their 07 advantages and disadvantages? OR Explain the importance of power factor improvement. State the different Q.3 **(a)** 07 methods of power factor improvement and explain any one in detail. What is string efficiency? Explain various methods of improving string efficiency. 07 **(b)** 0.4 State different types of insulators used in transmission and distribution lines. 07 **(a)** State their application, advantages and dis-advantages of each. Explain self GMD and mutual GMD. 07 **(b)** OR **O.4** Explain (i) Skin effect and (ii) Proximity effect. 07 **(a)** (b) Why neutral grounding is important. Explain any one method of neutral 07 grounding with a neat sketch. State different types of sub-stations. With a neat diagram explain the working of 07 Q.5 **(a)** double bus-bar with single breaker arrangement and give it's advantages and dis-advantages. (b) Explain (i) Wind –solar hybrid system and (ii) Binary cycle thermal power plant 07 with neat diagram OR A single phase a.c. generator supplies the following loads: 07 Q.5 **(a)** (i) Lighting load of 20kW at unity power factor. (ii) Induction motor load of 100kW at p.f. 0.707 lagging Synchronous motor load of 50kW at p.f. 0.9 leading (iii) Calculate the total kW and kVA delivered by the generator and the power factor at which it works.

(b) State the major equipments used in sub-station and explain their functions. 07

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