Exam. Code: 0937
Sub. Code: 6995

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B. Engg. (Electrical and Electronics Engineering)
7th Semester
EE-709 (Elective-I): Electrical Power Generation

Time allowed: 3 Hours | Max. Marks: 50

NOTE: *Attempt five questions in all, including Q. No. 1 (Unit-I) which is compulsory and selecting two questions each from Unit II-III.*

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UNIT-I

I. (a) What are the various energy sources available in India?
(b) How peak diversity is useful is designing a power system?
(c) What are the factors which limit the size of power plant?
(d) Discuss advantages of run-off river plant when run in combination of steam power plant.
(e) How local factor affects cost of energy. (5×2)

UNIT-II

II. (a) Draw chronological, load-duration curve, and energy curve of the given 24 hour data of a system:

Time	12PM	2AM	6AM	8AM	12AM	12:30PM
Load (MW)	24	12	12	60	60	48
Time	1PM	5PM	6PM	12PM		
Load (MW)	60	60	84	24		

(b) What are methods of short term load forecasting? (5+5)

III. (a) What are the factors which are taken into account for tariff making? How power factor plays a major role in tariff making?
(b) A power system/station has following data:

	Max. demand	LF	Diversity between consumption
Residential load	1200kw	0.21	1.32
Commercial load	2400kw	0.32	1.2
Industrial load	6000kw	1.22	1.22

Overall diversity factor may be taken as 1.42. Determine max. demand on system, daily energy consumption overall power factor, connected load assuming that demand factor for each load is unity. (5+5)

IV. (a) A 440 volts 50Hz, star connected induction motor draws a line current of 40A at 0.8 lagging power factor. It is desired to bank of delta connected capacitors to raise overall power factor to 0.95 capacitor of the bann.
(b) Find the most economical power factor when KVA demand is constant. (5+5)

P.T.O.

UNIT-III

V. The annual costs of operating a 15000kw thermal power station are as:

Cost of plant	Rs. 1080/kw
Interest, insurance, taxes	5%
Depreciation	5%
Cost of primary distribution system	Rs. 6,00,000
Cost of secondary distribution system	Rs. 1,08,000
Interest, insurance, taxes & depreciation on secondary distribution system	5%
Maintenance of secondary distribution system	Rs. 2,16,000/-
Plant maintenance cost:	
Fixed cost	Rs. 36,000
Variable cost	Rs. 48,000
Operating cost	Rs. 7,20,000
Cost of coal	Rs. 7.2/KN
Consumption of coal	30×10^4KN
Dividend to stock holders	Rs. 12×10^6
Energy loss in T/m	10%
Maximum demand	14000kw
Diversity factor	1.5
Load factor	0.7

Determine charge/kw/year and rate/kwh. (10)

VI. (a) Discuss variation of costs of power plant versus its capacity while selecting size and number of generating units.

(b) A certain plant has a fixed cost of Rs. 4×10^4 and a salvage value of Rs. 4×10^3 at the end of useful life of 20 years. What will be the valuation half way through its life based on straight line depreciation method, reducing balance depreciation method? (5+5)

VII. (a) Discuss advantages of hydro-thermal co-ordination.

(b) Derive coordination equations for hydrothermal coordination. (5+5)

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