Reg. No.

MANIPAL INSTITUTE OF TECHNOLOGY MANIPAL (A constituent Institution of MAHE, Manipal)

V SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

MAKE-UP EXAMINATIONS, MAY 2018

SUBJECT: GENERATION, TRANSMISSION & DISTRIBUTION [ELE 3104]

REVISED CREDIT SYSTEM

Time	e: 3 Hours	Date: 11 May 2018	Max. Mark	ks: 50
Instru	 Answer ALL the questions. Use of ordinary graph sheet m Missing data may be suitably a 	ay be allowed. assumed.		
1A.	Enumerate the differences b Hydel power plant.	etween Impulse and Reaction turbine	s used in	(03)
1B.	Discuss the functions of the fo ii) Superheater, iii) Condenso	llowing in coal fired thermal plant: i) Eco r and iv) Boiler.	onomizer,	(04)
1C.	With a neat sketch, explain th plant.	e working of Fast Breeder Nuclear reac	tor power	(03)
2A.	The following data pertain catchment area = 500 km ² efficiency=85%, generator eff of rainfall is lost due to evap developed and suggest the typ speed 240 rpm are used.	to a hydroelectric plant. Available h e, annual average rainfall = 150 cm ficiency=95%, head lost in penstock= 7 oration, load factor=60%. Determine t be of turbine to be used if 5 units with t	ead=50m, n, turbine .5%. 25% he power he runner	(04)
2B.	Discuss the merits and demer	its of 4-stroke Diesel engine.		(02)
2C.	Show that the internal induct conductor. The conductors aluminum wire having a dian Determine the inductance of t is due to internal flux linkages	ance of a conductor is independent of s of a single phase 50 Hz line is a so neter of 0.412 cm. The conductor spac he single phase system. How much of in s?	size of the lid round ing is 3m. nductance	(04)
3A.	A 300 km, 132 kV, 3-phase (52 + j 200) ohms per phase a per phase. The line is supplyin constants and hence compute line efficiency. Use nominal pi	overhead line has a total series imported a total shunt admittance of j1.5 x 10 mg 40 MVA at 0.8 pf lagging at 132 kV. For sending end voltage, current, power for equations.	edance of ³ siemens ind ABCD factor and	(07)
20	Eurolain the following i) Dravi	mitre offect ii) Formanti offect iii) Trance	n o citi o n	(02)

3B. Explain the following: i) Proximity effect, ii) Ferranti effect iii) Transposition. (03)

- **4B.** A 3-phase, 220kV, short line has a total series impedance of 200 \perp 80⁰ Ω /ph. The sending end voltage is 240kV. By drawing circle diagram (i) Find the maximum power delivered and the corresponding power factor (ii) rating of shunt compensator when the line supplies 60 MW at 0.8 pf lagging keeping the sending and receiving end voltages at 220kV and (iii) rating of shunt compensator to maintain the voltages at 220kV on no load. (06)
- **4C.** What is corona? Write the expression for corona loss and discuss the factors affecting it. (04)
- Discuss the effects of ice loading and wind loading on sag. 5A. (02)
- **5B.** What is string efficiency? List the factors that affect string efficiency. In a 3 phase, 33 kV overhead line there are three units in the string of suspension insulators. If the capacitance between each insulator pin and earth is 11 % of self-capacitance of each insulator, find (i) the distribution of voltage over three insulators and (ii) string efficiency
- **5C.** Compare underground cables with overhead lines. With a neat diagram, explain the construction of single core cable. (04)

(04)