UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination – December, 2019

Course : Power Transmission and Distribution (PIPM 7003)   **Semester – I**
Programme : MBA – P.M.
Time : 3 Hrs.
Instruction :   **Marks : 100**

Section A—20 Marks

Attempt all Questions
Answer true or false or explain as asked in question

S No.		Marks	CO
Q-1	Metering of electricity power consumption is industrial is done with help of instrument transformers for correct meter readings	1	CO1
Q-2	A.T.C. losses are more than core losses	1	CO1
Q-3	The Power factor of induction motor is unity.	1	CO1
Q-4	DDUGJY is for Power system Upgradation.	1	CO1
Q-5	Saubhagya Scheme is for upgradation of power system network	1	CO1
Q-6	The touch voltage in earthling system is considered as 523 volts.	1	CO1
Q-7	The alternating current transmission lines of length more than 250 km are classified as medium transmission lines.	1	CO1
Q-8	The scope of IT applications in power sector is more in distribution sector than transmission sector.	1	CO1
Q-9	In power line carrier communication capacitor is used as open circuit point for power frequency (50 cycles) AC power.	1	CO1
Q-10	The ten delta (di electric dissipation factor) of new transformer is unity (1.0).	1	CO1
Q-11	The Myrex index number (MIN) of new transformer oil is 1000.	1	CO1
Q-12	Acetylene gas (C_2H_2) is evolved when paper insulation of transformer is overheated.	1	CO1
Q-13	Thermal imaging camera is not useful for detecting actual hot spot in a transformer.	1	CO1
Q-14	A direct current line can carry 2 times of power in comparison to alternating current line.	1	CO1
Q-15	AT&C losses are higher than technical losses.	1	CO1
Q-16	Bucholz relay in a transformer protects it from overloading by electricity consumers.	1	CO1
Q-17	Silica gel is used to protect the transformer from atmospheric air.	1	CO1
Q-18	Transformer oil is a mineral oil of good electrical conductivity.	1	CO1
Q-19	The earth resistance of the earth pipe used in earthling practices is one ohm.	1	CO1
Q-20	Instrument transformer is used to measure the efficiency of transformer.	1	CO1

Section B—20 Marks

	Attempt any four questions.	Marks	CO
Q-1	Analyze the advantages and dis-advantages of high voltage direct current system.	**5**	**CO2**
Q-2	Evaluate the golden rules for preventing of power transformer failures and describe all 8 number maintenance schedules for transformer.	**5**	**CO2**
Q-3	Analyze why Reforms were necessary in Power Distribution Industry. Describe in details the Distribution reforms and their restructuring	**5**	**CO2**
Q-4	The maximum (peak) load on a thermal power plant of 60 mW capacity is 50 mW at an annual load factor of 50%. The loads having maximum demands of 25 mW, 20 mW, 8 mW and, 5 mW are connected to the power station. Determine: (a) Average load on power station (b) Energy generated per year (c) Demand factor (d) Diversity factor	**5**	**CO3**
Q-5	(a) Draw a single line diagram of a 220/132 kv substation. (b) Evaluate the method of improving power factor in alternating current systems (AC system)	**2.5** **2.5**	**CO2**

Section C—30 Marks

	Attempt any four questions	Marks	CO
Q-1	Analyze the new technologies in electricity power transmission	**7.5**	**CO3**
Q-2	Evaluate all the various electricity energy storage Technologies	**7.5**	**CO3**
Q-3	Analyze the earthling in electricity system what are the points to be earthed in an electricity substation. Why black metal is used in electricity substation switch yards.	**7.5**	**CO4**
Q-4	Analyze the merit order operation of power house related with frequency for power grid operations	**7.5**	**CO3**
Q-5	Analyze and Draw the diagrams of various naturals cooling of transform oil in transforms and its temperature distributions	**7.5**	**CO4**
Q-6	Any undertaking consumes 6×10^6 kWh per year and its maximum demand is 2000 kW. It is offered two tariffs. Calculate the annual cost of energy. (a) Rs. 80 per kW of maximum demand plus 3 paise per kWh. (b) A flat rate of 6 paise per kWh.	**7.5**	**CO4**
Q-7	(a) Evaluate the capitalized cost of transformer with factors affecting the evaluation of the cost of different transformers. (b) Analyze the all electricity power Quality parameters with their cause, effects on electricity distribution supply systems etc.	**4** **3.5**	**CO4**

Section D—30 Marks

	Attempt any two Questions	Marks	CO
Q-1	Analyze, Evaluate and Compare the Central Electricity Authority (Installation and Operation of Meters) Regulations – 2006. On all relevant 20 No. points in details	**15**	**CO5**
Q-2	Analyze, critically and evaluate all the four Electricity Acts with their Purposes of Change (a) Indian Electricity Act 1910 (b) Electricity Act 1948 (c) Electricity Regulatory Commission Rules 1998 (d) Electricity Act 2003	**15**	**CO5**
Q-3	**(a)** Following is given a real case study diagram of a transmission substation about 10 Sq.km geographical area. Calculate the voltage drop and power loss of a single circuit line having following particulars at point X? for future planning of distribution network for proper voltage at consumer end as per Electricity Act, 2003 and Indian Electricity Rules, 1956 guidelines. 132/33KV Substation — 33 K.V. Line — 33K.V. Load 11M.W. Length – 16 K.M. — X Receiving end load = 11000 K.W, 50c/s, 3-phase Power Factor = 0.8 lagging Length = 16 km Line Voltage (Receiving end) = 33kv **(b)** Following is given a real case study diagram of a rural distribution substation about 2 Sq.km geographical area. Calculate the voltage regulations at the tail end load at Point X of the following L.T. rural feeder of A.A.C., ANT conductor [7/3.31] 11/.4 KV Transformer — 7.5 HP — 5 HP — 5 HP 0.3 KM — 0.2 KM — 0.2 KM 0.2 KM — 0.1 KM — 0.25 KM 0.1 KM — X 5 HP — 7.5 HP — 7.5 HP — 10 HP (a) Load in H.P. (b) Distance in KM. (c) Diversity factor 2.5 (d) Power factor 0.8 (e) Regulation constant is 38.16 for 7/3.31 MM AAC ANT conductor	**7.5** **7.5**	**CO5**

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