Name: **Enrolment No:**	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2018

Program: MBA (Power Management) **Semester – I**
Subject (Course): Power Generation and Power Station Management **Max. Marks : 100**
Course Code : PIPM 7001 **Duration : 3 Hrs**
No. of page/s: 2

Section – A (2 marks * 10 = 20 Marks)

S. No.		Marks	CO
	Fill in the blanks with the most suitable option. The options are given in front of each question.		
1.	In a coal fired thermal power plant, higher specific coal consumption is an indicator of _____ efficiency. (Increased, Decreased, Stagnant)	**2**	**CO1**
2.	In a subcritical thermal (coal) power plant, the role of steam drum is to _____. (Heat water, Heat water and steam, Separate steam from water).	**2**	**CO1**
3.	_____ power plant is capable of addressing peak load. (Hydro, Nuclear, Coal, Biomass)	**2**	**CO1**
4.	Supercritical power plants have _____ heat rates compared to subcritical power plants. (Higher, Lower, Equal, Astronomical).	**2**	**CO1**
5.	Electricity Act 2003 aimed to create a _____ regime in the Indian Power Sector. (Monopoly, Market Based, Strictly Regulated, Highly Governed)	**2**	**CO1**
6.	Water walls are made up of _____. (Risers, Downcomers, Steam drum, Concrete)	**2**	**CO1**
7.	Air preheater (APH) deals with _____. (Incoming air only, Flue gases only, Both incoming air and flue gases, none of these)	**2**	**CO1**
8.	Of all the components of boiler, _____ faces the flue gases at highest temperature. (Reheater, Radiant Superheater, Convective Superheater, Steam Drum)	**2**	**CO1**

9.	The circulation ratio in a supercritical boiler is _____ (More than one, Equal to one, Lesser than one)	**2**	**CO1**
10.	_____ is the predominant mode of heat transfer in economizer. (Conduction, Convection, Radiation)	**2**	**CO1**
Section – B (5 marks * 4 = 20 Marks) **Answer all questions in this section:**			
11.	Briefly explain the following along with their impact on the economics of power generation:		
a)	PLF	**5**	**CO2**
b)	Availability	**5**	**CO2**
c)	Heat rate	**5**	**CO2**
d)	Specific fuel consumption	**5**	**CO2**
Section – C (10 marks * 3 = 30 Marks) **Answer all questions in this section:**			
12.	Considering current trend and future plans, forecast the role of Hydro power plants in India's power sector.	**10**	**CO2, CO3, CO4**
13.	Operating a coal fired power plant at higher steam pressure and higher steam temperature within the designed range is always beneficial. Explain.	**10**	**CO2, CO3**
14.	From the perspective of satisfying the electricity needs of a country like India, it is unfair to compare 1 MW of thermal power (coal or gas based) capacity with 1 MW of renewable power (solar or wind) capacity. Justify.	**10**	**CO2, CO3**
Section – D (30 marks * 1 = 30 Marks) **Answer any one question from this section:**			
15.	Explain the various challenges faced by India's power sector and suggest remedies.	**30**	**CO2, CO3, CO4**
16.	Discuss current scenario of rural electrification in India and the challenges associated with it. Suggest remedial measures for more effective and accelerated rural electrification.	**30**	**CO2, CO3, CO4**

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Section – A (2 marks * 10 = 20 Marks)

S. No.		Marks	CO
	Fill in the blanks with the most suitable option. The options are given in front of each question.		
1.	Electricity Act 2003 aimed to create a _____ regime in the Indian Power Sector. (Monopoly, Market Based, Strictly Regulated, Highly Governed)	**2**	**CO1**
2.	_____ power technology generate DC power that need to be converted into AC through an inverter. (Solar thermal, Solar PV, Wind, Biomass)	**2**	**CO1**
3.	Air preheater (APH) deals with _____. (Incoming air only, Flue gases only, Both incoming air and flue gases, none of these)	**2**	**CO1**
4.	Of all the components of boiler, _____ faces the flue gases at highest temperature. (Reheater, Radiant Superheater, Convective Superheater, Steam Drum)	**2**	**CO1**
5.	The circulation ratio in a supercritical boiler is _____ (More than one, Equal to one, Lesser than one)	**2**	**CO1**
6.	_____ is the predominant mode of heat transfer in economizer. (Conduction, Convection, Radiation)	**2**	**CO1**
7.	In a sub-critical thermal (coal) power plant, the role of steam drum is to _____. (Heat water, Heat water and steam, Separate steam from water).	**2**	**CO1**

8.	In a coal fired thermal power plant, higher specific coal consumption is an indicator of _____ efficiency. (Increased, Decreased, Stagnant)	**2**	**CO1**
9.	_____ power plant is capable of addressing peak load. (Hydro, Nuclear, Coal, Biomass)	**2**	**CO1**
10.	Supercritical power plants have _____ heat rates compared to subcritical power plants. (Higher, Lower, Equal, Astronomical).	**2**	**CO1**
Section – B (5 marks * 4 = 20 Marks) **Answer all questions in this section:**			
11.	Briefly explain the following along with their impact on the economics of power generation:		
a)	PLF	**5**	**CO2**
b)	Availability	**5**	**CO2**
c)	Heat rate	**5**	**CO2**
d)	Specific fuel consumption	**5**	**CO2**
Section – C (10 marks * 3 = 30 Marks) **Answer all questions in this section:**			
12.	From the perspective of satisfying the electricity needs of a country like India, it is unfair to compare 1 MW of thermal power (coal or gas based) capacity with 1 MW of renewable power (solar or wind) capacity. Justify.	**10**	**CO2, CO3**
13.	Operation and maintenance of a hydro power plant is comparatively simpler as compared to that of a coal fired power station. Justify.	**10**	**CO2, CO3, CO4**
14.	Discuss the following data on cost of power supply and revenue realization in India and explain its impact on power sector:	**10**	**CO2, CO3, CO4**

Year	cost of supply (paise/unit)	Realization(paise/unit)	
		Including Agriculture	Only Agriculture
2004-05	254	209	75.68
2005-06	260	221	76.36
2006-07	276	227	74.23
2007-08	293	239	77.27
2008-09	340	263	87.13
2009-10	355	268	88.70
2010-11	398	303	119.75
2011-12	455	330	135.14
2012-13	501	376	148.67
2013-14	518		175
2014-15	520		

Source:- PFC Reports on the performance of State Power Utilities

Section – D (30 marks * 1 = 30 Marks)

Answer any one question from this section:

15.	Explain the various challenges faced by India's power sector and suggest remedies.	**30**	**CO2, CO3, CO4**
16.	It is unfair to evaluate the benefits of a reservoir based hydro power project from the perspective of power generation alone. Justify.	**30**	**CO2, CO3, CO4**